An investigation into the cognitive-behavioural model of obsessive-compulsive disorder (O.C.D.) : can this be reconciled with a neurological deficit model?.

Shafran, Rosamund Lucy

An Investigation into the Cognitive-Behavioural Model of Obsessive Compulsive Disorder: Can this be reconciled with a Neurological Deficit Model?

Rosamund Lucy Shafran

Submitted for the University of London degree of PhD

Institute of Psychiatry

De Crespigny Park

Denmark Hill

London SE5 8AF

Acknowledgements:-

This thesis would not have been possible without the assistance and inspiration provided by the following:- Professor Jack Rachman, Professor Jeffrey Gray, Dr. Derek Bolton, Dr. Paul Salkovskis, Dr. Frank Tallis, Padmal de Silva, Joanne Ralph, Dr. Ian Jakes, Dana Thordarson, Cindy Lopatka, Shirley Chumbley, Liz Drawbridge and Merle, Dr. David Veale, Maria Watson, Marc Jackson, Julie Gottlieb, Victoria Shafran, Dr. Maryanne Martin, Dr. Mansur Lalljee, Kerrin Isaacs, Dr. Elizabeth Isaacs, Jackie Smith, Nicholas Troop, Paul Burgess, Dr. Bryan Lask, Dr. Rachel Waugh and the Great Ormond Street Eating Disorders Research Team. Special thanks to all the people with OCD and concerned friends/relations who so kindly gave their time for the research projects, and to my parents.

Many thanks to the Wellcome Trust for funding this thesis by awarding the author a Wellcome Trust Prize Studentship.

This thesis is dedicated to my parents, Christina and Michael Shafran, and to my friend and colleague, Dr. Ian Jakes.

Table of Contents

Tables

Figures

PREFACE

During the course of the thesis, over 500 people made contact with the 'Obsessive-Compulsive Disorder Research Project'. Many wrote moving letters, volunteering to help in researching this disabling and distressing condition. Throughout the thesis, there are quotes from some of the letters and comments of subjects so that clinical experience can be used to illustrate theoretical discussion. The quote which opens the chapter and the thesis serves as a reminder of the distress and fear experienced by people, and the need for research into the disorder.

ABSTRACT

In the past decade, there has been a resurgence of interest in Obsessive-compulsive disorder (OCD). This dissertation concentrates on the investigation of the cognitive-behavioural model of OCD proposed by Salkovskis (1985, 1989). The model is described, and relevant data reviewed. Empirical investigations are conducted into the nature of anxiety in OCD, the role of guilt and religion, and the importance of perceived responsibility for threat. The cognitive bias of 'Thought-Action Fusion' is illustrated using two cases, and is explored by means of a questionnaire study. The findings from the investigation and development of the cognitive-behavioural model are summarised.

Recently, models which conceptualise OCD as a neurological disorder have gained popularity. However, there has been little attempt to integrate the neurological model with the cognitive-behavioural model. There appears to be support for both models, and throughout the thesis, data are generated to test the hypothesis that OCD is heterogeneous. In particular, it is suggested that some patients may have OCD which is characterised by excessive anxiety, responsibility and guilt, as suggested by the cognitive-behavioural model, whilst others show neurological deficits of the type suggested by the neurological model. The hypothesis that these two groups are mutually exclusive is tested.

The neurological deficit model is described, and two studies are reported, the primary aim of which is to generate data to test the heterogeneity hypothesis. The first study is on neurological soft signs in people with OCD, and the other investigates their neuropsychological test performance. The studies are also of intrinsic interest and are considered within the relevant literature.

The criteria needed to be able to test the heterogeneity hypothesis are considered and analyses are conducted to determine whether the data generated throughout the thesis fulfill these criteria. Based on these results, the heterogeneity hypothesis is revised and tested.

The findings from the thesis are drawn together and summarised in the final chapter. The current status of the cognitive-behavioural and neurological models is considered. Future work designed to translate the research findings to the clinic is described by means of a conclusion.

CHAPTER 1

Introduction

"I could not tell anybody about it, as I thought they would probably put me in a nutters home or something" (SJ).

1.1. General Overview

Research in Obsessive-compulsive disorder (OCD) has been revitalised in the last decade. According to a `Psychological literature' search, articles with `OCD' in the title grew from 50 in 1983 to 183 in 1993. This renewal of interest can be attributed to three major developments in the field. First, the large Epidemiological Catchment Area study gave an indication that the prevalence of the disorder may be between 1.2% and 2.4% of the general population (Karno, 1988). If this is a true reflection of the prevalence of the disorder, OCD is the fourth most common psychiatric disorder after phobias, substance abuse and depression. Second, the successful application of cognitive-behavioural theories to the treatment of panic has inspired the extension of those principles to other psychological disorders (Clark 1986; Salkovskis 1985, 1989). Third, the development of new scanning techniques such as nuclear Magnetic Resonance Imaging (nMRI) has enabled the functioning of the brain to be examined much more closely and accurately than ever before. The close investigation of brain functioning in OCD has led to models in which the disorder is characterised as primarily one of neurological (basal ganglia) dysfunction (Baxter, 1990; Rapoport and Wise, 1989).

Much of the dissertation concentrates on the investigation of the cognitive-behavioural model of OCD proposed by Salkovskis (1985, 1989). However, one of the difficulties in the field of OCD research is that proponents of the neurological models of the disorder, and

those of cognitive-behavioural models, rarely address each other. There appears to be support for both models, and it is possible that OCD is a heterogeneous disorder. In particular, it is suggested that some patients may have OCD which is characterised by excessive anxiety, responsibility and guilt, as suggested by the cognitive-behavioural model, whilst others show neurological deficits of the type suggested by the neurological model, and that these two groups of patients are mutually exclusive. Throughout the thesis, this suggestion will be referred to as 'the heterogeneity hypothesis'.

1.2. Aims

The thesis has two aims.

1) To investigate and develop the cognitive-behavioural model of OCD.

2) To investigate whether the cognitive-behavioural model can be reconciled with the neurological model of OCD by means of the `heterogeneity hypothesis'.

1.2.1. The 'Heterogeneity Hypothesis'

This hypothesis states:

> There will be two separate, homogeneous subgroups within the sample of OCD patients. One of these groups will be characterised by neurological/neuropsychological impairments, the other will be characterised by high levels of anxiety, guilt and responsibility.

In order to test the heterogeneity hypothesis, it is first necessary to determine whether there are two groups which are themselves homogeneous. For the groups to be homogeneous, the following criteria must be met:-

GROUP 1

Subjects in this group must show neuropsychological test performance deficits and an abnormally high number of neurological soft signs. It is expected that neuropsychological test performance deficits and the number of neurological soft signs will be postively correlated.

GROUP 2

Subjects in this group must show higher levels of anxiety, responsibility and guilt than the normal population. It is therefore expected that these variables will be inter-correlated.

1.3. Thesis Contents

This introductory chapter starts by providing an overview of the state of current research in OCD and the relationship between neurological and psychological approaches is discussed. The aims of the thesis are stated, and the structure of the thesis is documented referring to these aims. A brief historical overview of psychological and neurological approaches to OCD provides a context in which to view the current investigations. Chapter 2 sets out the cognitive-behavioural model of OCD that is to be investigated in the thesis. The third chapter investigates the role of anxiety in OCD, using measures of anxiety that have not been widely administered to an obsessional population. In particular, the 'four systems' measure of anxiety is investigated with a view to refining the type of anxiety that may be characteristic of OCD. Data generated in this study are used to test the heterogeneity hypothesis. Chapter 4 uses questionnaires to investigate the role of religion and guilt in OCD. Excessive religiosity has often been clinically observed in OCD, yet few empirical studies have been carried out. Similarly, guilt has been considered a core feature of OCD, although studies on the normal population have produced conflicting and confusing results. As in chapter 3, there are two aims of the study. The first is to investigate the role of religiosity

and guilt in OCD and to consider the findings within the cognitive-behavioural model of OCD. The second is to generate data to test the 'heterogeneity' hypothesis. The fifth chapter comprises a series of investigations examining the role of responsibility in OCD. Salkovskis's re-emphasis on the importance of personal responsibility in the aetiology and maintenance of the disorder has been one of the most exciting developments of the cognitive-behavioural model and has stimulated a considerable amount of interest. The first of the studies describes the development of a questionnaire to assess responsibility in general. The second reports the results of a study looking at specific responsibility in OCD, and its association with measures such as guilt, depression and anxiety. The final study details an experimental manipulation of responsibility, and the associated effects on obsessional symptoms. The aim of the studies in this chapter is primarily to test the cognitive-behavioural model of OCD. The subsequent chapter aims to develop the cognitive-behavioural model further, by considering the role of a particular cognition in which thoughts and actions are fused. A study investigating this cognitive bias is reported. The chapter concludes by summarising the investigation and development of the cognitive-behavioural model, based on the work of the thesis.

The emphasis changes in the seventh chapter to the examination of the neurological model of OCD. This model is described and the differences between neurological and cognitive-models are considered. One possible resolution of the conflict between the two models is that OCD is heterogeneous and this hypothesis is detailed. The second half of the chapter reports a study of neurological soft signs in OCD patients. The aim of this study was primarily to generate data to test the heterogeneity hypothesis, but a secondary aim was to investigate neurological soft-signs in OCD. Similarly, the eighth chapter reports on a study of the neuropsychological aspects of OCD, with the dual aims of generating data to test the heterogeneity hypothesis, but also to determine the nature of any neuropsychological deficits

in OCD patients. The ninth chapter reviews the literature on heterogeneity within OCD more fully, and the heterogeneity hypothesis that is being tested is fully explained. As stated above, a condition necessary to test this hypothesis is that two homogeneous sub-groups must exist. Analyses are reported to determine whether the data generated throughout the thesis support the suggestion that homogeneous sub-groups are present. Based on these analyses, the heterogeneity hypothesis is revised and tested using cluster analysis. The final chapter draws together the findings from the thesis and comments on the current status of the cognitive-behavioural and neurological models of OCD, and the hypothesis that different sub-groups may exist. Future research based on the thesis is suggested by means of a conclusion.

1.4. Limits to the thesis

Owing to limitations of time, and space, this thesis does not address the following issues which are acknowledged to be important and interesting.

- *The 'Serotonin Model' of OCD.* The 'serotonin' model of OCD is widely considered to provide the best account of the disorder. In brief, this model considers OCD to be the result of a downregulation of the serotonergic system. This model derives from the effectiveness of serotonin re-uptake inhibitors in the amelioration of symptoms of OCD. This model was not investigated as part of the thesis for the following reasons:-
    - The reasoning behind this model is flawed. It is not possible to infer the cause of an abnormality by retrospective reasoning from one (of several) treatment effects. Aspirin may cure a headache yet it does not mean that lack of aspirin was the cause of the headache. No more do the therapeutic effects of serotonin medications reveal the cause of OCD.

- Studies of this nature are invasive
- The model is exclusively pharmacological.

- *The role of memory in OCD.*
- *The role of personality in OCD*
- *The effects of thought suppression on OCD*
- *Tourette's Syndrome, tics and OCD*
- *Gray's model of the Behavioural Inhibition System and its role in OCD (Gray, 1982)*
- *Reed's cognitive deficit model of OCD (Reed, 1985).*

1.5. The Relationship between Neurology and Psychology

Obsessive-compulsive phenomena have been documented for over 400 years and have stimulated debate about the nosology of the disorder for much of that time. Throughout history, the competing theories concerning the aetiology of OCD have primarily been psychological in orientation with views that it is a disorder of intellect (e.g. Westphal, 1877), volition (e.g. Esquirol, 1838) or emotion (e.g. Morel, 1866; Janet, 1903). The psychoanalytic theory of OCD (e.g. Freud, 1926) predominated during the early 20th century. Biological/neurological theories such as those of Luys (1881) and Schilder (1938) were often proposed within the framework of one of these psychological theories, as evidenced by the search for a neurological substrate for 'the will' . The search for a neurological substrate underlying obsessional symptoms by Schilder did not challenge the view that the disorder is primarily psychological. Rather, Schilder accepted that psychological phenomena had neurological substrates and that both psychology and neurology could inform about the disorder, providing explanations at different 'levels'.

However, in the latter half of the twentieth century, the compatibility between

neurological and psychological aspects of OCD has been reduced. Those who adopt a cognitive-behavioural model to conceptualise the disorder do not deny that there are neurological substrates at the basis of all behaviour (Salkovskis, 1995). However, blood flows through neurological substrates are presumed to reflect psychological phenomena, as well as contributing to them. The view taken by these theorists is that it is the psychological processes that are critical to understanding the disorder, and that neurological substrates may reflect these processes but do not cause them.

Recently, with technological developments such as functional brain imaging, there has been a solid basis of support for theories which conceptualise OCD as a neurological disorder *rather than* a psychological problem. Instead of regarding neurological and psychological explanations as compatible but at different levels, neurological theorists have argued that the disorder has been misconceived and miscategorised and is more akin to a motor disorder resulting from structural and functional abnormalities in the basal ganglia rather than a psychological disorder (e.g. Rapoport, 1990). Advocates of a 'neurological' deficit approach to OCD believe that compulsive behaviours are a direct reflection of a primary neurological deficit. The view of OCD as a neurological disorder is reflected by the inclusion of OCD in a book entitled 'Motor Disorder in Psychiatry' (Rogers, 1992).

The relationships between brain and behaviour are extremely complex, and it is possible that the neurological and psychological approaches are at different 'levels'. Both neurology and psychology are concerned with the organisation and control of behaviour (Gray, 1985). There is, nonetheless, a distinction between mental categories such as 'thoughts' and the neurological processes that may underlie certain 'cognitive' operations (Hallam, 1985a). Similarities at a conceptual level do not amount to identity at a neurological level (Hallam, 1985a). A fundamental difference between 'neurological' and 'psychological'

perspectives on OCD is that the former views OCD as a 'deficit'; the neurologists suggest that there is a 1:1 relationship between a dysfunction in a particular brain region, such as the basal ganglia, and that this is manifest directly as obsessional behaviour (Wise and Rapoport, 1989). The cognitive-behavioural approach acknowledges that anxiety, guilt, intrusive thoughts and motor behaviour could, perhaps, be served by different brain regions and that blood flow in one region may change if, for example, anxiety levels change. However, the approach emphasizes that cognitive-behavioural phenomena are fundamental to the disorder, are on a continuum with normal behaviour, and are not the manifestation of an underlying brain abnormality.

1.6. Historical Overview

This section reviews the documentation of obsessional phenomena, and provides a historical context of neurological and psychological approaches to OCD in which to consider the current theories and debates.

1.6.1. Phenomenology of OCD

"It felt to me that there was a breakdown in communication between my eyes and my brain. I could see that I had done everything correctly but my brain couldn't accept it on just one checking." (AC).

Obsessive-compulsive phenomena have been documented throughout history with three main types of account:- religious, medical and psychological. Each account is reflective of the particular historical period (Rachman and Hodgson, 1980). With respect to the religious

period, doubts and impulses were reported to beset Martin Luther in 1517 while celebrating mass. He was overwhelmed with 'scruples' and felt the need to confess daily; he was tortured by blasphemous thoughts which rendered him `bitterly disquieted' (see Lewis, 1965). The case of William of Oseney (described by Jeremy Taylor in 1660 and reported in Hunter and MacAlpine, 1963) was also religious in nature and was considered as a 'religious melancholy' in which his devotion to study became `vexatious and intolerable' until his studying grew from three hours to twelve, repeatedly reading the same books. An obsession (or 'scruple' as it was termed) was `a doubt when doubts are resolved'. The obsession with religious duties was described by John Moore (1692, in Hunter and MacAlpine, 1963) as a condition in which people were troubled by `naughty and sometimes Blasphemous Thoughts' which start in their minds despite `all their endeavours to stifle and suppress them' (p.252). The indecisiveness which characterises obsessive-compulsive phenomena was identified even before 1660 by Richard Younge (quoted by Hunter and MacAlpine, 1963) and was described as `an empty Balance with no waight of Judgement to incline him to either scale..he does nothing readily..when he begins to deliberate, never makes an end'.

Progressing from a background of medical theories which presumed obsessional phenomena to be the result of fevers and disordered imaginations to an era in which psychological interpretations of behaviour were prominent, Esquirol (1838) described the case of his patient, Mademoiselle F. This lady described her thoughts as unwanted and yet irresistible, which allowed Esquirol to suppose that this was a disorder in which there was insight. Legrand du Saulle consolidated the clinical description of Obsessive-compulsive disorder by detailing 27 cases in 1875 and outlining the natural history of the disorder.

The cases of Legrand du Saulle had prominent symptoms of depression and psychosis. Characteristics of the disorder, such as the 'waxing and waning' over time, the rigid personality

of the patient and the replacement of one obsession/compulsion with another over time, led du Saulle to classify the disorder as one of 'insanity with insight'. He recorded the presence of fears and anxieties arising from unwanted thoughts and images, suicidal brooding and `obsessional paralysis' (Berrios, 1989). However, his case descriptions included analysis of phobias and epileptic states (behaviours that were not considered to be those of a 'neurosis' at the time) and led directly to the over-inclusive nature of Janet's category 'Psychasthenia', to which OCD was considered to belong.

The descriptions of over 300 cases by Pierre Janet (1903) which led to the establishment of the category 'psychasthenia', are considered among the greatest clinical descriptions of obsessive-compulsive phenomena written (Slater and Roth, 1977; Pitman, 1987).The classification of obsessive-compulsive phenomenology within the category of 'psychasthenia' did not draw a distinction between obsessive-compulsive phenomenology and other disorders that were also included within the same category such as panic disorder, phobias, tic disorders, hypochondriacal and confusional states and some forms of epilepsy (Berrios, 1989).

The isolation of OCD as a distinct concept arose from the introduction of the central role of resistance in obsessive-compulsive phenomena as documented by Lewis (1936) (see later). From the date of the publication of 'Obsessional Problems' (Lewis, 1936), consensus grew as to the composition of the clinical phenomena of obsessions and compulsions, with Lewis later noting that `it is seldom difficult to recognize an obsession' (Lewis, 1938). However, he also noted that `to be sure of an obsessional state calls for careful psychiatric examination and judgement' (Lewis, 1938). It appeared that everyone knew what obsessive-compulsive phenomena looked like, but there was little consensus as to a theoretical framework within which they might be considered. The majority of conceptualisations were

based on psychological interpretations of the phenomena, and the history of the psychological theories of obsessive-compulsive disorder is documented below.

1.6.2. History of Psychological Approaches

The classification of OCD within a psychological framework has long stimulated debate and controversy. Esquirol (1838) considered the obsessive-compulsive phenomena of Mlle. F. (see p. 9) to exemplify a weakness in her `volitional faculty'. At that time, obsessive-compulsive symptoms would likely have been classified within the category *'folie raisonnante',*, which was used to describe insanity without delusions. Esquirol argued for the classification of the illness as a form of volitional monomania in which there was a 'disease of the will' (*`délire partiel'*; Esquirol, 1838). This disease was characterised by `involuntary, irresistible, and instinctive activity' and the patient is `chained to actions that neither his reason nor emotion have originated, that his conscience rejects and his will cannot suppress' (see Berrios, 1989 for further detail). The introduction of a `disease of the will' by Esquirol was not a new idea, and had been in circulation in European Psychiatry since 1810 (Berrios, 1989). Included in the domain of a `disease of the will' were impulsions, a class of symptoms which included all paroxysmal, stereotyped and involuntary actions. Hence obsessive-compulsive phenomena were categorised with epileptic seizures, phobias, homicidal and suicidal tendencies, manic behaviours and hypochondriacal preoccupations (Dagonet, 1870). The extent of the similarity between impulsions and compulsions is an issue which arose in the work of Janet (1903) and is cause for debate even today (see Pitman, 1987).

Esquirol's concept of monomania met with opposition and was criticised on several grounds, not least of which was that subjective symptomatology, which had become important in defining a mental disorder, was poorly acknowledged within this classification category.

With decline of the concept of monomania, OCD was re-classified under the new category of `*folie avec conscience*' or insanity with insight (Société Médico-Psychologique, Paris, 1875).

The demise of the category of `volitional monomania' was accompanied by the demise of the view of OCD as a disorder of volition and the rise of the view that OCD was an emotional disorder. The most influential proponent of this view was Morel (1866), another Frenchman, who argued convincingly for consideration of the disorder as one of emotional dysfunction rather than intellectual or volitional incapacitation. His argument was based on analysis of seven cases and he classified OCD under the category of *'délire emotif'*. This category included phobias, fixed ideas, impulsions, dysphoria, unmotivated fears and vasomotor and digestive symptomatology. This classification of OCD as a neurosis was popular but did not exlcude the possibility of a neurological basis for the emotional disturbance.

The astute clinical observations made by Legrand du Saulle (1875) included the observation that fear and anxiety resulted from unwanted thoughts/images and consolidated the view that this was a disturbance of emotion. During this period in history psychological explanations of disorders were favoured within a context which was *émotivité.* Other schools of thought did, nevertheless, counter the conceptualisation of obsessive-compulsive phenomena as arising from emotional dysfunction.

One counter-theory was that of Westphal (1877), working in parallel with Morel (1866), who took the view that the disorder was `intellectual' in origin (Berrios, 1989). Westphal believed obsessions to be ego-dystonic variants of fixed ideas and did not adhere to the view that insight was critical in distinguishing obsessions from delusions; in particular he did not consider lack of insight to be a necessary criterion for a delusion. Instead he argued

that obsessional presentations (*Zwangvorstellungen)* resulted from a primary dysfunction of `intellect' . Although supported by Haskovec (1901), the `intellectual dysfunction' view of obsessive-compulsive phenomena was a minority view. Some, e.g. Ribot (1904), still subscribed to the view of Esquirol that obsessive-compulsive phenomena are `a disease of the will resulting from weakness of character and accompanied by pathology of the intellect'.

However, conceptualisation of obsessive-compulsive phenomena as reflective of a disorder of emotion came to dominate the international forum, with clinicians such as Paulhan (1897), Fere (1902), and Pitres and Regis (1902) all supporting this view (see Berrios, 1989 for further details). The emotive view was established as the primary theory of the time with the work of Pierre Janet in *'L'Automatisme Psychologique'* (1889), and *'Les Obsessions et la Psychiasthenie'* (1903). Janet's work owes much to his predecessors and his belief was that psychasthenic illness may be divided into three stages: the psychasthenic state in which there is a sense of incompleteness or imperfection, which is followed by the stage of forced agitations in which excessive, repetitive and useless manias, ruminations, tics, agitation, phobias and anxiety occur. The final stage of obsessions and compulsions is reserved for ideas that are provoked easily, generalise and dominate the mind of the patient. A particular type of personality, in which social withdrawal and inertia were prominent, was thought to be associated with the psychasthenic illness.

The concept of OCD underwent further refinement after Schneider (1938) defined obsessions as the `contents of consciousness which, when they occur, are accompanied by the experience of subjective compulsion, and which, when they cannot be got rid of, though on quiet reflection they are recognised as senseless'. This definition was amended by Aubrey Lewis in his seminal paper 'Problems of Obsessional Illness' (1936). In this work, the importance of **resistance** in obsessive-compulsive phenomena was emphasized and was

considered to be more important than the patient acknowledging the disorder to be senseless. Lewis argued that there must be `mention of the feeling that one must resist the obsession. This resistance is experienced as that of one's free will'. The importance of resistance was illustrated with cases to enable obsessive-compulsive phenomena to be distinguished from other psychiatric phenomena such as occur with schizophrenia and encephalitis lethargica. The influence of Lewis is reflected in the DSM-IV criteria for OCD within the category of anxiety disorders (APA, 1994) (see figure 1). The amendment of the criteria of 'senselessness' in DSM IV indicates that the psychiatric establishment of the last decade of the 20th Century has acknowledged that this is not essential, more than 50 years after Aubrey Lewis made his observations.

Figure 1. DIAGNOSTIC CRITERIA FOR OBSESSIVE-COMPULSIVE DISORDER (DSM IV, APA).

A. Either Obsessions or Compulsions:

Obsessions as defined by: (1), (2), (3), and (4):

(1) recurrent and persistent ideas, thoughts, impulses, or images that are experienced, at some time during the disturbance, as intrusive and inappropriate and that cause marked anxiety and distress

(2) the thoughts, impulses or images are not simply excessive worries about real-life problems.

(3) the person attempts to ignore or suppress such thoughts, impulses or images, or to neutralise them with some other thought or action

(4) the person recognises that the obsessions are the product of his or her own mind, not imposed from without (as in thought insertion)

Compulsions as defined by (1) and (2):

(1) repetitive behaviours (e.g., hand washing, ordering, checking) or mental acts (e.g., praying, counting, repeating words silently) that the person feels driven to perform in response to an obsession, or according to certain rules that must be applied rigidly.

(2) the behaviours or mental acts are aimed at preventing or reducing distress or preventing some dreaded event or situation; however, these behaviours or mental acts are either not connected in a realistic way with what they are designed to neutralize or prevent, or are clearly excessive.

B. At some point during the course of the disorder, the person has recognised that the obsessions or compulsions are excessive or unreasonable. **Note:** This may not apply to children.

C. The obsessions or compulsions cause marked distress, are time-consuming (take more than an hour a day), or significantly interfere with the person's normal routine, occupational (or academic) functioning, or usual social activities or relationships.

D. If another Axis 1 disorder is present, the content of the obsessions or compulsions is not restricted to it (e.g. preoccupation with food in the presence of an Eating Disorder; hair pulling in the presence of trichotillomania; concern with appearance in the presence of Body Dysmorphic Disorder; preoccupation with drugs in the presence of a Substance Use Disorder; preoccupation with having a serious illness in the presence of Hypochondriasis; preoccupation with sexual urges or fantasies in the presence of a Paraphilia; or guilty ruminations in the presence of Major Depressive Disorder.

E. The disturbance is not due to the direct physiological effects of a substance (e.g., a drug abuse, a medication) or a general medical condition.

Specify if:

With Poor Insight: if, for the most time during the current episode, the person does not recognise that the obsessions and compulsions are excessive or unreasonable

Whilst Lewis pleaded for attention to be paid to the patient's subjective experience of the symptoms, psychoanalytic theorists suggested that the basis of the disorder could be found in the patient's subconscious. The psychoanalytic theories of Obsessive-compulsive disorder proposed by Freud (1955, published 1909) suggested that obsessions were defensive psychological responses to unconscious impulses to harm one's parents. The anal-sadistic stage of development was thought to be important in the development of the disorder and the patient with obsessive-compulsive phenomena was thought to regress to this earlier stage with the resultant ego, superego and id all functioning at that level (Jenike, 1990). A personality characteristic was thought to be associated with the disorder and Freud described the personality of the patient as`anal-erotic', in which order, cleanliness and rigidity are conspicuous. His description of the personality which accompanies the obsessive-compulsive phenomena led to the comment by Lewis (1936, p.326) that `much that is summed up in the concept of an anal-erotic character will remain unproven'. Later Lewis wrote a paper emphasizing the contrasts between the personality associated with obsessive-compulsive phenomena in the conceptualisation by Freud and Janet. He wrote `It is an error to suppose that only one type of personality is significantly associated with the development of obsessional illness. The`anal-erotic' and the `psychasthenic' concepts indicate the extreme divergence that can exist in the approach to this problem' (Lewis, 1965, p.304)

If personality is considered to be important in determining obsessive-compulsive phenomena, it is assumed that this would be considered under the rubric of a psychological approach to obsessive-compulsive disorder, rather than a neurological one. Even though personality is considered to have neurological substrates, as evidenced e.g. by the search for the biological basis of Eysenck's dimensions of introversion-extraversion (Eysenck, 1952;

Gray, 1970), personality is still considered to be within the domain of psychology rather than neurology.

Also within the domain of psychology, but not excluding the important role of neurological substrates which underlie the mechanism, is the learning/behavioural theory of obsessive-compulsive disorder. This theory is based on the work of Mowrer (1939; 1960), in which a two-factor model suggested that classical conditioning as described by Pavlov (1928) could explain how fears are acquired. Moreover 'Fear is a decisive and causal factor in avoidance' (Mowrer, 1960, p.97). Escape and avoidance of the feared stimuli would then serve to reduce its aversiveness by a process of operant conditioning. The following observations were made from experiments using dogs, and provided support for the learning model of OCD:-

- it was hard to extinguish an avoidance response to a stimulus that had become classically conditioned by a paired association with a strongly aversive stimulus
- the avoidance behaviour tended to become stereotypical
- inability to avoid the stimulus led to the reappearance of anxiety (Solomon, Kamin and Wynne, 1953)

Wolpe (1958) also emphasised the role of anxiety and commented that `it may be stated as a dogma that the strength and frequency of evocation of obsessional behaviour is directly related to the amount of anxiety being evoked in the patient' (p. 90). If one considers obsessions and compulsions as a form of avoidance behaviour (which in 1980 Rachman and Hodgson believed most theorists to do, p.169), `it follows that fear is a decisive causal factor in compulsive behaviour'. Learning theory or behaviour theory suggested that the acquired fear response leads to avoidance behaviour in the form of compulsions, designed to avoid the

feared consequence of the obsession and reduce the associated anxiety (Gray. 1971; Rachman and Hodgson, 1980).

A series of experiments supported much but not all of the anxiety-reduction explanation of obsessive-compulsive phenomena (Rachman and Hodgson, 1980). This explanation was more successful in accounting for compulsive behaviour than obsessions. In particular, the explanation failed to account for the origins of the obsessions. Not all obsessions can be traced back to the association between an unconditioned stimulus and an aversive stimulus. The critical findings are reviewed in Rachman and Hodgson (1980) and include the success of behaviour therapy for OCD (see Abel, 1993 for an updated review). One of the greatest powers of the theory is that the therapy which derived from the theory has been found to be effective for many people and that it was the theory which gave rise to the treatment rather than the other way round. The limitations of behavioural therapy, such as the drop-out rate and the extent to which patients are completely well at the end of treatment, has led to the a cognitive elaboration of the behavioural approach by Salkovskis. This approach is described in chapter 2.

At the time that the book 'Obsessions and Compulsions' was written (Rachman and Hodgson, 1980) the statement that most theorists regard obsessions and compulsions as a form of avoidance behaviour may not have been controversial. However, nowadays obsessions and compulsions are considered by many to be manifestations of chemical and structural abnormalities in the brain. How is it that the pendulum in the conceptualisation of OCD has swung so far in the direction of neurology compared to psychology? It now seems that the search for a neurological basis of anxiety to assist in the elucidation of obsessive-compulsive phenomena has been supplanted by the search for a direct neurological basis for the symptoms. The following section outlines the history of the concept of OCD as a

neurological disorder in order that current theories can be placed in historical context.

1.6.3. History of the Neurological Perspective on OCD

The second half of the 19th century was a period of revival for all aspects of emotion, including the search to elucidate the relationship between emotions and the autonomic nervous system. Morel (1866) believed that all emotional disorders, among which he included OCD, were localised in the ganglionic system; this was the first suggestion of the role of ganglionic dysfunction in OCD.

Although Luys (1881) took issue with Morel's view that all vegetative functions were localised in the ganglionic system, he closely related the phenomenology of OCD to underlying cortical functions; in particular he suggested that nervous excitation of the separate cortical areas underlying ideas, emotions and actions would give rise to strange ideas, involuntary emotions, or compulsive behaviours. The close association between neuroses and underlying cortical structures was taken for granted at this stage of history.

However, investigation into biological bases for obsessive-compulsive disorder was not conducted with much enthusiasm or rigour during the following decades as psychological theories began to take hold. Exceptions to this included the passing mention of the role of impaired brain circulation by Ball (1892), Magnan's view that obsessions and compulsions represented brain degeneration (1890) and the suggestion by Ameline (1901) that cerebral disease may contribute to the aetiology of the disorder. Meige and Feindel (see Lewis, 1957) continued to examine the organic basis of obsessional troubles, but the area lay dormant in the early 20th Century as psychological theories gained momentum. The interest in post-encephalitic obsessional behaviour was revitalised in the German literature between 1921 and 1930, in particular as researchers searched for the psychopathology which would link an

organic basis for the symptoms with its psychological aspects, such as the `anal-erotic character'. Schilder (1938) rose to the challenge.

Working within a psychoanalytic context, neurological changes resulting from the encephalitis were suggested by Schilder (1938) to cause changes in the chemical structure of the brain which, in turn, released hostile impulses which the patient tried to control by compulsive behaviour. Schilder suggested that patients `with a partially organic origin of the increase in aggressive impulses... react very well to psychoanalysis as well as to group psychotherapy'. Schilder estimated `about 1/3 of the obsessive and the compulsive cases show organic signs pointing to pathology with the same localization as that found in encephalitis. These changes may be constitutional, or they may be due to lesions in foetal life, to birth traumas or to toxic and infectious processes of unknown origins'. However, this estimate was based on evidence which Aubrey Lewis was later to describe as `highly disputable' (Lewis, 1957), and has not been supported by further investigation (e.g., Grimshaw, 1964).

In his analysis of the neurological histories of 103 obsessional patients compared with 105 non-obsessional neurotic patients, Grimshaw (1964) found three cases of encephalitis among the obsessionals and none among the controls. Nineteen percent of the obsessional group had a history of neurological illness, compared with 7.6% in the neurotic control group. Although this study was reliant on patient reports to obtain the history of neurological illness none of the signs outlined by Schilder were found in the sample. However, six of the obsessional patients were likely to be suffering from Sydenham's chorea. This is interesting given more recent findings of a high prevalence of obsessive-compulsive symptoms in individuals with Sydenham's Chorea (Swedo, 1989).

Grimshaw's study was unique at the time, and for subsequent decades, in that it was

an investigation of the hypothesis that neurological impairment causes OCD. This differs from a search for a neurological substrate which may underlie OCD. This distinction between the search for a neurological substrate of OCD and a direct organic cause of the disorder is not made in many studies conducted during the 1960s which examined the use of psychosurgery to alleviate OCD. The effects of leucotomy on obsessional symptoms was investigated in a series of studies by Kelly and colleagues (e.g. Kelly et al., 1966; Kelly et al., 1972). The aim of the leucotomy operation was to disconnect the orbital and medial frontal cortex from the limbic system, which had long been acknowledged as the anatomical site for emotional behaviour (Papez, 1937). The role of the limbic system , in particular the hippocampal formation, was also examined in the work of Gray (1982). He suggested that OCD may arise from an oversensitive septo-hippocampal system in which too many stimuli are being designated as `important', leading to searching, checking and ritualising. Implicit in this research was that OCD was still considered to be a disorder of anxiety and emotion and the aim was to identify the mechanism by which this disorder may develop.

Studies of electroencephalogram (EEG) recordings conducted on anxiety patients during the 1960s and 1970s were aiming to identify whether patients with anxiety disorders (including OCD) had cerebral dysfunction. Turner et al., (1985) have reviewed these findings and concluded that there was `some evidence for abnormal EEG patterns in obsessive-compulsive patients. The abnormalities are inconsistent and do not present a clear indication of the location of the disturbance'. Disturbances were considered to potentially `implicate a dysfunction in one of the known arousal systems'. Although these studies were not designed to address the issue of whether the disorder is primarily psychological or neurological in origin, it is not unreasonable to suppose that a consistent neurological structural abnormality would give rise to consistent and recognisable patterns of abnormality on an EEG (as in the

case of epilepsy).

The genetic and family studies of the 1970s also did not specifically address the issue of whether the disorder was one of neurology or psychology. Details of these studies will not be included as they have been reviewed elsewhere (Turner et al., 1985; MacDonald et al., 1992; Rasmussen, 1993). Turner et al.'s review concluded that `the studies reviewed thus far present some basis for hypothesizing a biological predisposition for the development of OCD. This predisposition may take the form of a genetic aberration or some type of structural weakness' (Turner et al.,, 1985). However, the review by MacDonald indicated that there was very little evidence for a genetic basis for the disorder, but rather a general vulnerability to anxiety disorders could be heritable.

The differing conclusions of the two groups - Turner et al.'s review can be seen as supporting the conceptualisation of OCD as a neurological disorder whereas that of MacDonald and colleagues is more consistent with a psychological model - was perhaps an early indication of the way that the neurological/psychological debate regarding the nature of OCD would be activated in future years. The advent of modern brain scanning techniques has revitalised the debate as to whether OCD is best conceptualised as a neurological or psychological disorder in a way that Esquirol, Morel, Schilder and Grimshaw could never have envisaged.

CHAPTER 2

The Cognitive-Behavioural Model of OCD: A review of the model and a study of anxiety.

"[I'm] fearful of being responsible for an accident, death, suicide, miscarriage of justice, failure to catch a criminal. Also [I have] fear of this fear - [I'm] frightened of [the] guilt I would feel if I ever felt responsible for any of the above" (J.K.)

2.1. General Introduction

In the introductory chapter, reference was made to the 'cognitive-behavioural' model of OCD. The first half of this chapter describes and reviews the behavioural model of OCD. Evidence in support of the model is described, and the limitations which led to the incorporation of a cognitive component are discussed. The reformulated cognitive-behavioural model is detailed, and evidence for this model is critically reviewed. This model places anxiety at the core of OCD, and the second half of the chapter reports on a questionnaire-based study to investigate the type of anxiety that may characterise the disorder.

2.2. Behavioural Approaches in General

In the early 20th century, psychologists believed that the nature of mental functioning was best studied by introspection. However, this method of analysis was found to be limited and John Watson (1878-1958) changed the focus from introspection to the study of behaviour

e.g. 'Psychology as the behaviorist views it, is a purely objective experimental branch of natural science. Its theoretical goal is the prediction and control of behavior'. (p.158).

The strong belief in the importance of replicable, objective observation as the basis for an empirical science can be traced back to behaviourism (Hallam, 1985b). Experimental procedures investigating learning in animals were conducted to determine which direct observable responses could be reliably elicited by stimuli. The premise was that information about stimulus-response associations would enable human behaviour to be predicted and controlled. Thus the behavioural approach focuses on the behaviour of living organisms and how those organisms respond to events. Internal mechanisms such as cognitions, are largely ignored (Hirschorn, 1993).

Much of the behavioural approach concentrates on how a person is shaped through his/her constant interactions with the environment. Three types of learning were identified by behaviourists - classical conditioning, operant conditioning and modelling (see Hirschorn, 1993).

The behavioural approach assumes that abnormal behaviour, including obsessional compulsive behaviour, is learned in the same manner as other, normal, human behaviours. According to this approach, all behaviours can be modified using counter-conditioning.

2.3. The Behavioural Approach to OCD: The key role of anxiety.

Mowrer (1939, 1950, 1960) suggested that anxiety formation was a two-stage process of fear and avoidance. Mowrer proposed that classical conditioning was responsible for the formation of fear of specific stimuli and anxiety; maintenance of the fear was due to operant conditioning processes as the organism learns to reduce aversive stimuli by firstly escaping and then avoiding the fear-associated conditioned stimuli. Hence in this second phase, anxiety/discomfort is strengthened negatively by the termination of an unpleasant event.

Data from animal experiments by Solomon, Kamin and Wynne (1953) showed that

avoidance responses to highly aversive classically conditioned stimuli were extremely resistant to extinction. Not only did the avoidance behaviour continue in the absence of the conditioned stimuli, but it became stereotypical in nature, persistent, and high levels of anxiety re-appeared when such behaviour was prevented.

Eysenck and Rachman (1965) developed Mowrer's two-stage model, but it was later rejected following failure of attempts to condition fear in the laboratory, failure to observe the acquisition of fear in natural circumstances when it might have been expected, and the frequent absence of identifiable frightening and/or painful events at the time of onset of clinical phobias (Rachman, 1976a). Owing to these difficulties, Rachman and Hodgson (1980) revised the two-stage theory and proposed a three stage analysis of the kind introduced by Peter Lang (1970). The revised model incorporated cognitive features and behavioural-cognitive responses in addition to psycho-physiological reactions. They also distinguished between active and passive avoidance. Stimuli that may elicit anxiety/discomfort are avoided (passive avoidance) whilst active avoidance such as checking, washing and mental rituals, serve to 'put matters right' and will take place if the passive avoidance fails. These three major components are summarised in Figure 2.1.

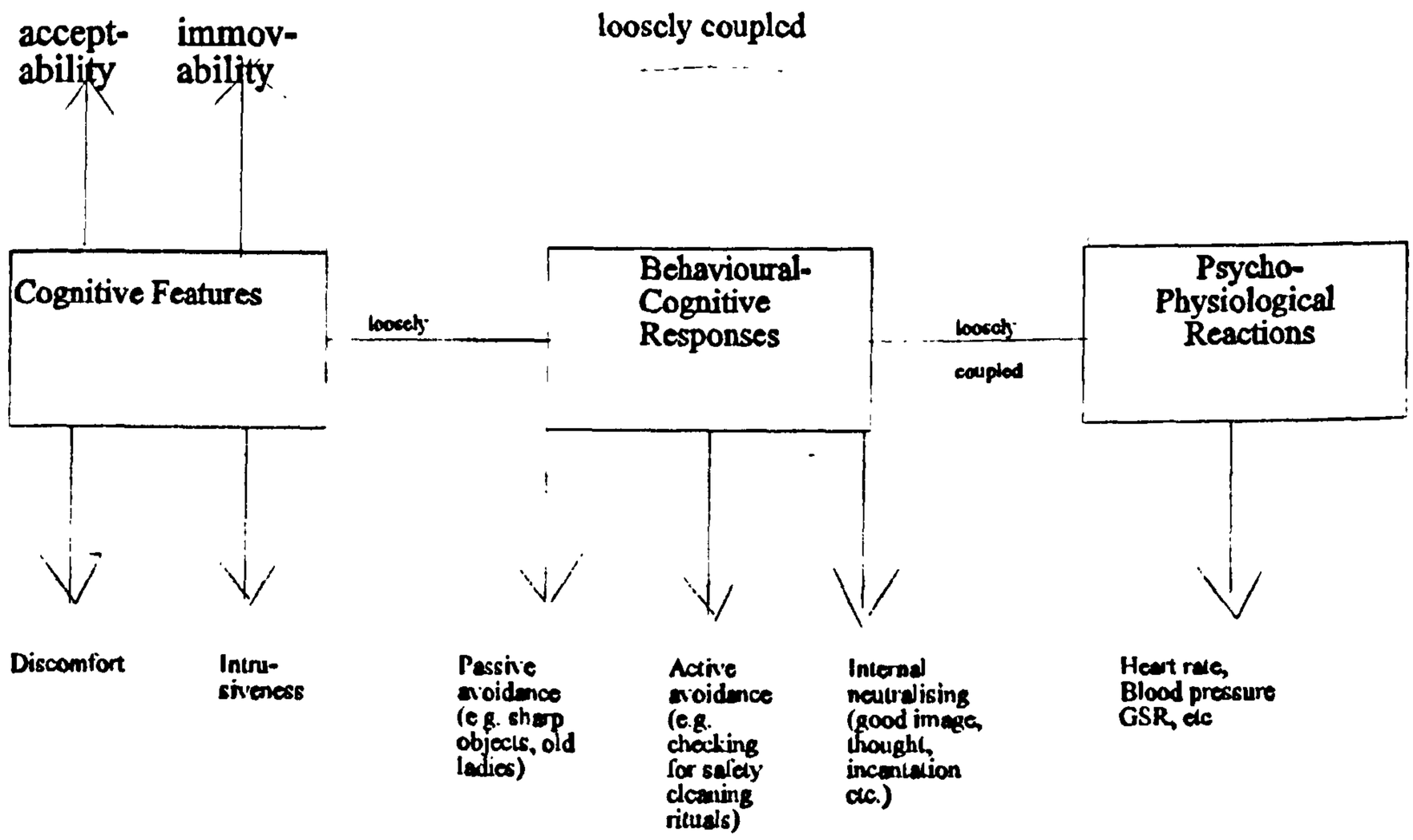


Figure 2.1. An Anatomy of Obsessions. The 3 major components - cognitive, psycho-physiological and behavioural-cognitive - are said to be loosely coupled. The major features of each component are also illustrated. From Rachman and Hodgson (1980, p. 266).

The role of anxiety is central to the formulation proposed by Rachman and Hodgson. Anxiety is elicited by exposure to the feared stimulus, and 'the essence of the theory is that compulsions reduce anxiety.' (Rachman and Hodgson, 1980, p. 167). Compulsive behaviours, both external behaviours such as checking, washing etc and internal behaviours such as counting or mental neutralising, are active 'neutralising' strategies taken to 'put matters right'

and reduce/avoid anxiety. In turn, completion of the compulsive rituals maintains the disorder as the 'reduction in fear will reinforce the immediately preceding response,' and hence'any response that produces successful avoidance..will be learned as a strong habit'. (Dollard and Miller, 1950, p.158 quoted in Rachman and Hodgson, 1980, p169). Furthermore 'the compulsive act produces only a temporary reduction in the anxiety..after a relatively short time, the anxiety starts to increase again so that the patient is motivated to repeat the compulsive act' (quoted p.169) and if a compulsive act is 'interrupted by a command or physical restraint, the subject experiences marked increases in anxiety..As soon as the compulsion is resumed, the anxiety disappears' (quoted p.169).

Thus the behavioural model proposes that the core of obsessional behaviour is anxiety - the stimuli that trigger obsessions elicit anxiety and compulsions serve to avoid and alleviate it. 'It may be stated as a dogma that the strength and frequency of evocation of obsessional behaviour is directly related to the amount of anxiety being evoked in the patient' (Wolpe, 1958, p. 90). Anxiety itself has fear-evoking properties, and the compulsive behaviours will be elicited not just from the fear evoked by the obsessional stimuli, but that the fear of the **anxiety** elicited by the stimuli serves to motivate avoidance behaviours (Rachman, 1989). Behaviour therapy, based on this model, exposes the patient to the feared stimulus, and curtails the avoidance ie the compulsive acts. The anxiety declines naturally over the course of approximately an hour (in theory but not always in practice!) and the motivation to avoid anxiety in future is weakened (Meyer, 1966).

2.4. Evidence for the behavioural model.

There is much evidence to support the behavioural model which places anxiety at the core of the disorder. Since most of the evidence before 1980 has been reviewed in Rachman

and Hodgson (1980), attention will be concentrated on data since 1980. For the purposes of the current discussion, the terms `fear' and `anxiety' will be used interchangeably. It should also be noted that some patients refer to feelings of `discomfort' rather than anxiety and hence, where appropriate, data referring to anxiety/discomfort are described.

2.4.1. Descriptive and Epidemiological Data

Although the first descriptions of obsessions were placed within the remit of melancholia, the important role of anxiety/fear was apparent in the clinical manifestation of the disorder, e.g., '..the cause of the affliction is a morbid impulse to utter a bad word or to do an ill deed. The impulse is bad enough, but the essence of the misery is not always so much the fear of actually yielding to it as the haunting nature of the fear of the fear. It is that which is the perpetual torture, an acute agony when active, a quivering apprehension of recurrence when quiescent.' (Maudsley, 1895, p.170).

The other early cases also described fear as a characteristic of the disorder, e.g. 'A woman of 38 had since childhood been abnormally clean and **afraid** of contamination' , 'A boy of 18..suffered much from **fears** of death' and 'A chorus girl of 22..was **afraid** she had harmed a baby by looking at it and touching it' (Lewis 1936, emphasis added). OCD has always been classified as a disorder of anxiety in systems such as the diagnostic and statistical manuals (American Psychiatric Association) and one of the criteria for diagnosis is that the 'obsessions or compulsions cause marked distress' (DSM IV, p423). The fear/anxiety experienced by an obsessional patient on the occurrence of an intrusion has been likened to a mother watching her child run out in front of an on-coming car (Salkovskis, 1989).

It may be that anxiety plays a greater role in some forms of OCD than in other forms of the disorder. It is argued that 'most forms of phobia are best construed as instances of

passive avoidance; hence one would expect to find an affinity between phobias and compulsive cleaning..They might also show evidence of a wider range of ordinary fears and perhaps at a more intense level than is encountered in the general population..It is predicted that they are more fearful than compulsive checkers' (Rachman, 1976b, p. 271-272). Later, it was suggested that 'there are certain respects in which compulsive cleaning rituals are closer to circumscribed phobias than to other obsessional problems, such as checking rituals'. (Rachman and Hodgson, 1980, p. 3).

There is also a strong co-morbidity between OCD and other anxiety disorders, although there is considerable overlap between depression and OCD as well with 80% of patients reaching the clinical cut-off on the Beck Depression Inventory (Beck et al., 1961) and 32% meeting current diagnostic criteria for a major depressive episode (Karno et al., 1988). The most recent prevalence data for the co-morbidity between OCD and other anxiety disorders is provided by the Epidemiological Catchment Area Study in the United States (Karno et al., 1988). This study was the largest of its kind and interviewed a randomly selected sample of 18,500 probands over a 7-year period in five sites across the U.S.A. It utilized a structured interview, the DIS, coded for DSM-III diagnoses; one of the most striking findings was that OCD was 50 to 100 times more common than the earliest estimation of Rudin (1953), which has since been found to be cited erroneously (MacDonald, 1994; personal communication). Approximately 2.5% of the population surveyed had a history of obsessive-compulsive symptoms in their lifetime that met diagnostic criteria for OCD, and 1.6% had had the disorder within the 6 months prior to the interview. It is notable that this places OCD as the fourth most common disorder after phobias, substance abuse and major depressive disorder. However, these findings must be regarded with caution, as lay interviewers were used to 'diagnose' OCD, and the interview schedule based on DSM III (the

'DIS'; Robins et al., 1981) had lenient criteria for the threshold of severity. In addition, the characteristics of the sample were different to that of a clinical sample in that (1) OCD rates were higher in women than men, (2) the majority of those identified had **either** obsessions **or** compulsions, not both and (3) rates of OCD were not exclusively associated with any level of educational attainment or marital status. Furthermore, when subjects from one site in the USA were re-interviewed by psychiatrists using the Present State Examination (Anthony et al., 1985), the original estimate for 1-month prevalence decreased from 1.3% to 0.3%.

Whilst bearing in mind the methodological problems outlined above, this study was the largest of its kind and its findings are worth reporting. In this study, 46.5% also had a lifetime diagnosis of a phobia, and 13.8% had met criteria for panic disorder during their lifetime (Karno et al., 1988). The co-morbidity between OCD and an anxiety disorder was greater than that of lifetime depression (31.7%), schizophrenia (12.2%) or alcohol abuse/dependence (24.1%). The results are comparable with the epidemiological study of Rasmussen and Eisen (1990), who found that 40% had a lifetime diagnosis of a phobia (simple or social) and 12% had a lifetime diagnosis of panic disorder. In this study, 67% had had a lifetime diagnosis of major depressive disorder.

These data were used by the the Cross National Collaborative Group led by Myrna Weissman (1994) to compare OCD (as assessed by the DIS) in seven countries: the United States, Canada, Puerto Rico, Germany, Taiwan, Korea, and New Zealand. The OCD annual prevalence rates were remarkably consistent among these countries, ranging from 1.1/100 in Korea and New Zealand to 1.8/100 in Puerto Rico. The only exceptionwas Taiwan (0.4/100), which had the lowest prevalence rates for all psychiatric disorders. Lifetime prevalence rates were between 1.9/100 (Korea) and 2.5/100 (Puerto Rico) with the exception of Taiwan (0.7/100). The mean age of onset ranged from 21.9 years (Edmonton) to 35.5 (Puerto Rico).

The percentage of subjects with OCD who had both obsessions and compulsions ranged from 13% in New Zealand to 57% in Munich (16% in the USA). Co-morbidity between OCD and Major Depression ranged from 12.4 % (Korea) to 60.3% (Munich; 27% in the USA), and comorbidity between OCD and another anxiety disorder ranged from 24.5% (Taiwan) to 69.6% (Munich; 14.3% in USA).

In summary, anxiety has always been considered as a part of the clinical manifestation of OCD, and there is evidence that there is a high degree of overlap between both OCD and depression, and OCD and disorders of anxiety.

2.4.2. The Normal-Abnormal Continuum

Central to the behavioural model is the suggestion that the same learning mechanisms produce normal and abnormal intrusions. The nature of obsessional symptoms within a normal population was first investigated in the late 1970s, and it was found that 84 % of the normal population experienced obsessions (Rachman and de Silva, 1978). The conclusion was that 'Obsessions, in the form of thoughts and/or impulses, are a common experience. A large majority of people report experiencing obsessions; it is unknown why the small minority fail to do so' (p.247). Furthermore:-

- 'The form, and to some extent the content as well, of obsessions reported by non-psychiatric respondents and by obsessional patients are similar.
- So called `normal' obsessions are also similar to `abnormal' obsessions in their expressed relation to mood and in their meaningfulness to the respondent'. (p.247).

Despite the similarities of form and content, abnormal obsessions were found to differ from normal obsessions in frequency, intensity and their consequences, in that abnormal obsessions (but not normal obsessions) provoked the urge to neutralize. It was concluded that obsessions are a normal phenomenon and the distinction between obsessions experienced in a psychiatric population and those experienced in the non-psychiatric population was quantitative in nature, rather than qualitative. This study provided support for one of the most critical tenets of the behavioural model of OCD. The findings were replicated by Salkovskis and Harrison (1984).

2.4.3. Psychometric Measures

Psychometric measures of OCD have been extensively reviewed by several different authors and the reader is referred to these papers for details regarding the psychometric properties of different methods of assessment of obsessional symptoms. These include the Leyton-Obsessional Inventory (LOI; Snowden, 1980), the Maudsley Obsessive-compulsive Inventory (MOCI; Hodgson and Rachman, 1977), the Padua Inventory (Sanavio, 1988), the Compulsive Activities Checklist (CAC; Philpott, 1975; Marks et al., 1977) and the Yale-Brown Obsessive Compulsive Scale (Y-BOCS; Goodman et al., 1989a, 1989b). Recent reviews include those by Goodman and Price (1990), Pato et al., (1994), Taylor (1995) and Tallis (1995).

All of the assessments incorporate some elements of the behavioural model with its focus on the fear-evoking properties of the stimulus and subsequent avoidant and/or neutralising response. Examples of the questions in the different assessments which reflect the behavioural model are given below:

- The LOI asks whether 'unpleasant or frightening thoughts or words ever keep going over and over in your mind' (Qu.2) and whether the person tries to 'avoid changes in your house or work in the way you do things' (Qu. 58)
- The MOCI asks for a TRUE/FALSE response to 'I avoid using public telephones because of possible contamination'
- The Padua Inventory asks for an endorsement of the statements 'I get upset and worried at the sight of knives, daggers and other pointed objects' and 'I avoid using public toilets because I am afraid of disease and contamination'
- The Y-BOCS takes into account the distress caused by obsessions and compulsions and notes that 'in most cases, distress is equated with anxiety'.
- The CAC rates activities such as dressing, washing etc on a 4-point scale according to four criteria, one of which is avoidance.

On all of these measures, people with OCD score significantly higher than healthy or anxious controls (Goodman and Price, 1990; van Oppen, 1994; Tallis, 1995); this is consistent with the behavioural view that anxiety and avoidance are important components of OCD. However, it should be noted whilst scores on these indices correlate highly with measure of anxiety, these are not solely measures of anxiety since they have criterion validity.

2.4.4. Experimental analyses

Rachman and Hodgson (1980) conducted a series of experiments to test the behavioural theory. They found that, in general:

- Eliciting the obsession led to an increase in anxiety/discomfort .

- Compulsions decreased the anxiety/discomfort.
- Delaying the compulsions led to a `spontaneous decay' of anxiety/discomfort over a longer period of an hour.
- Interruption of the checking ritual did not provoke a significant change in anxiety/discomfort.

- Delaying the compulsions led to a `spontaneous decay' of anxiety/discomfort over a longer period of an hour.

- Both checking and washing led to a significant reduction of anxiety/discomfort although on 7 of 36 occasions, a group of checkers indicated increased discomfort after checking.

(Rachman and Hodgson, 1980, p.177; Röper et al., 1973, p.275; Röper and Rachman, 1976).

These results are mainly consistent with the behavioural theory, although the hypothesis that interruption of the compulsion would lead to an increase in anxiety/discomfort was not supported. More recently, Salkovskis et al. (1991) found that neutralizing increased the salience of intrusive thoughts in a non-clinical sample of people reporting compulsive behaviours.

Of note is the observation that, after the compulsion is performed, 'anxiety elevation occurs in a minority of instances' (Rachman and Hodgson, p.193, emphasis added) . In some patients, compulsions were not followed by a reduction in anxiety/discomfort. In other patients, the same compulsion was sometimes followed by an increase in anxiety and at other times followed by a decrease. Some compulsions persisted regardless of the level of anxiety before or after the completion of the compulsion. (Rachman and Hodgson, 1980, p.191).

It was suggested that in these cases compulsions persisted because they alleviated guilt or remote worries or else, in the case of patients whose compulsions sometimes alleviate anxiety but at other times increase it, it may be as though they delay the probability of some remote unpleasantness i.e. 'the person purchases longer term `safety' at the expense of short-term increments in anxiety/discomfort' (p.192). This explanation may, perhaps, be served by a cognitive bias in that patients may interpret their anxiety/discomfort as confirmation that their compulsions are having some real-world effect, i.e. preventing harm. The rationale may be `I am feeling something in response to performing my compulsions and therefore my compulsions are doing something'. It is also possible that the individuals whose anxiety increases or is irregular on performing the compulsion are more depressed than individuals whose compulsions serve to alleviate anxiety; they may believe themselves to be worthless and therefore that they `deserve' to feel anxious or upset. These sorts of cognitive distortions may serve to maintain the compulsive behaviours in the absence of the reduction of anxiety. At present, there is no evidence to support this hypothesis. Alternatively, it may be that inappropriate triggering of the striatum gives rise to the motor behaviour which is, for some patients, completely devoid of a consistent association with anxiety.

2.4.5. Genetic

'I am now 49, but at age about 9 started having problems with OCD...My son also showed symptoms at age 9, worsening throughout adolescence, but now aged 22, seems free of it (relatively). My daughter (20) has never shown any signs of the problem. My father was a sufferer, but not my mother or sister' (JK).

The association between OCD and other anxiety disorders has also been examined by

means of genetic studies. These have recently been reviewed (MacDonald et al., 1992; Rasmussen, 1993; Rasmussen, 1994). In summary, 'the twin data support the existence of a heritable factor for neurotic anxiety. Some studies support the hypothesis that there is a heritable factor for OCD, while others do not' (Rasmussen, 1994, p106). Despite some inconsistencies in the family studies, the consensus is that the rates of anxiety disorders are significantly higher among relatives of obsessional probands compared with the relatives of controls (Black et al., 1992; McKeon and Murray, 1987). These results are consistent with the behavioural model, which emphasises the key role of anxiety in OCD.

2.4.6. Treatment

One of the tests of the behavioural model is whether treatment is effective when based on the model. The treatment is `exposure and response prevention' (ERP) in which patients are exposed to the feared stimuli and prevented from carrying out their compulsions. This therapy focuses on a) reducing the association between the feared stimuli and anxiety and b) the association between carrying out the compulsions and a reduction in anxiety. This method is thought to be effective through mechanisms of habituation and extinction (Grayson et al., 1986; Kozak et al., 1988). A recent review of the literature (Abel, 1993) made the following conclusions (p. 464):-

- 'Exposure with response prevention has been effective in alleviating the symptoms of OCD in clinical trials and more recently in at least 10 studies investigating the various factors expected to enhance the effects of ERP'.
- 'The efficacy of ERP has been supported by empirical investigations that have compared it to non-pharmacological treatments'.

- 'Comparisons of response prevention vs exposure indicate that exposure is more useful in treating anxiety in the presence of feared stimuli and response prevention is more useful in arresting rituals'.

However, the limitations of behavioural treatment were a driving force in the development of a cognitive component to add to the model, since the treatment is only effective for 75% of patients that undergo it, and drop-out rates can be high (Foa, 1979).

2.4.7. Summary and Conclusion

The behavioural model of OCD considers anxiety to be a fundamental part of the maintenance of the disorder. Descriptive and epidemiological data support the suggestion that anxiety is a central feature of OCD. Data on normal and abnormal obsessions indicate that differences are primarily quantitative as opposed to qualitative and it is plausible that the same learning mechanism gives rise to both. Psychometric measures of OCD all incorporate assessments of anxiety or anxiety responses such as avoidance. Experimental studies of the late 1970s manipulated anxiety levels by eliciting obsessions and delaying compulsive activity (for example) and the majority of the predictions made by the behavioural model were supported. Interestingly, there was a sub-group of patients for whom anxiety was not alleviated by compulsions as predicted by the theory but for whom anxiety was elevated. Possible explanations for this, such as cognitive distortions, were suggested. Genetic studies appear to confirm that some general aspect of 'anxiety' is heritable. Finally, the effectiveness of behavioural therapy supports the behavioural model, although its limitations are the spur for cognitive developments of the model. It is concluded from the above review of the literature that there is strong evidence for the behavioural model of OCD, which places

anxiety at its core, but that there is room for further development of the model by incorporating a cognitive component.

2.5. Limitations to the behavioural model.

The cognitive element of the cognitive-behavioural model of OCD was introduced to overcome some of the limitations of the behavioural theory. The greatest limitation of the theory is that behavioural treatment is not always effective, and therefore other factors are thought to be important. Behavioural treatments usually results in a success rate of 75% or more (see Abel, 1993 for a review), but as with drug treatments, the patient is not 'cured'. Rather, the patient is better able to resist the compulsions and the unwanted intrusive thoughts become less intense and less frequent compared with before treatment. Furthermore, many patients are unable to undertake behavioural therapy (Foa, 1979). Clearly there is room for the development of a theory and corresponding treatment which increases both compliance and success rate.

2.6. Development of the Cognitive Component

The cognitive development of the behavioural theory was partly inspired by the cognitive nature of the disorder. Of all the psychological disorders, OCD begs consideration of cognitive factors as the phenomenology of the disorder incorporates obvious cognitive distortions concerning risk appraisal and responsibility (Carr, 1974; Rachman, 1976b). Cognitive accounts, such as Reed's (1985), which suggest a cognitive deficit, are inadequate since OC phenomena are not abnormal experiences at all, but are

more intense, more frequent, harder to dismiss and more distressing than the intrusive thoughts that occur to non-OCD patients. However, the difference is quantitative rather than qualitative (Rachman and de Silva, 1978; Salkovskis and Harrison, 1984). Explanations in terms of cognitions have long been offered by patients who report feeling compelled to wash their hands because of beliefs about contamination. The cognitive-behavioural formulation of OCD offered by Salkovskis built on the earlier work to propose an account of the disorder which had all of the benefits of the behavioural approach (including relatively successful treatment) but which incorporated a cognitive element.

Lazarus (1964, 1966) was among the first to identify the important role of conscious cognitions in the mediation of anxiety. He suggested that the experience of threat, which leads to anxiety, is mediated by cognitive processes. Two types of appraisal were identified as important in the experience of threat. The first, 'primary' appraisal, estimates the danger of an event relative to his/her perceived resources to cope with it. After the primary appraisal has been estimated, emotional reactions and behavioural responses are initiated on the basis of the person's 'secondary appraisal' of the likely consequences of his efforts to cope with the threat (see McFall and Wollersheim, 1979). In a review of the literature, Carr (1974) suggested that this primary appraisal of personal danger was distorted in patients with OCD who tended to exaggerate the danger relative to their ability to cope with it.

However, Carr (1974) noted the need to identify factors which may influence unrealistic subjective estimates of negative outcomes and the cognitive processes mediating the attempts to cope with the perceived threat (in OCD by carrying out a compulsion).

McFall and Wollersheim (1979) attempted to identify these factors and cognitive processes. They suggested that 'several unreasonable beliefs or assumptions have been learned by obsessive-compulsive individuals that heighten their tendency to overevaluate the dangerousness of events and thus experience threat'. Among the beliefs that were suggested were: 'Certain thoughts and feelings are unacceptable, having them could lead to catastrophe (e.g. anger will result in homicide), and one should be punished for having them', and 'One is powerful enough to initiate or prevent the occurrence of disastrous outcomes by magical rituals or obsessive ruminating' (p.335).

The authors go on to discuss deficits in secondary appraisals that result in underestimates of coping resources. Issues of personal control, low tolerance for uncertainty and anxiety are all brought into play. McFall and Wollersheim (1979) attempted to integrate their theory with psychoanalytic concepts, but the model lacked specificity and the psychological processes involved in intrusive phenomena were not elaborated.

Salkovskis (1985, 1989) attempted to elaborate these processes by conceptualising obsessions within the hypothesised framework of cognitive phenomena proposed by Beck (Beck et al., 1983). The basic assumptions behind the formulation are the same as those adopted by Beck (1976) and other cognitive theorists such as Rachman (1983) and Teasdale (1983). These assumptions are:

- emotions arise from the appraisal of thoughts and events rather than directly from those events
- pre-existing cognitive structures and processes influence appraisal

- appraisal and emotional responses tend to have a reciprocal relationship
- a person's behaviour affects appraisal and vice versa.

In the cognitive approach to psychological problems such as depression, the outcome of appraisal has been termed 'negative automatic thoughts' (Beck, 1976). In Salkovskis's cognitive-behavioural formulation, obsessions were clearly distinguished from negative automatic thoughts on the basis of differences in the perceived intrusiveness, immediate accessibility to consciousness and the ego-dystonic nature of the intrusion. The appraisal of the cognition was considered to be the negative automatic thought. Obsessions were placed within the domain of cognitive psychopathology by developing the suggestion of Rachman (1971, 1978) that they function as stimuli which provoke a particular type of negative automatic thought or appraisal. In particular, it was suggested that in some obsessional individuals, unwanted intrusions interact with an individual's belief system leading to a negative automatic thought concerning some adverse evaluation of responsibility such as ('this is a bad thing to be thinking' or 'something bad will happen and it is up to me to prevent it'). Throughout this thesis the term 'responsibility' is used to mean the person's subjective, PERCEIVED responsibility for an event, as opposed to an objective, actual responsibility for an event.

Distress is suggested to result when the intrusions have some personal meaning or salience, perhaps by activating pre-existing dysfunctional schemata. 'Such automatic thoughts in response to intrusions appear to relate specifically to ideas of being responsible for damage or harm coming to oneself or to others, or associated imagery of a similar nature... That is, obsession-provoked automatic thoughts or images revolve around personal responsibility, the possibility that if things go wrong, it might well be the person's

own fault. Such responsibility may be indirect as well as direct, so that the possibility of preventing harm caused by external agents is equally potent' (Salkovskis, 1985, p. 574).

Such dysfunctional schemata may exist in people of 'tender moral conscience' who are inclined to place special significance on their thoughts, perhaps owing to religious instruction (see chapter 4). The dysfunctional assumptions which are suggested to interact with the intrusion to produce the negative automatic thoughts were suggested to include (i) 'Having a thought about an action is like performing the action' and (ii) 'responsibility is not attenuated by other factors (e.g. low probability of occurrence)'. Therefore, the cognitive distortion in OCD is suggested to relate to 'an inflated belief in the probability of being the cause of serious harm to others or self, or failing to avert harm where this may have been possible rather than an increased belief in the probability of harm per se' (p.575; original emphasis).

The appraisal of the intrusion in terms of responsibility for harm, leads to attempts to neutralise and suppress the thought, image or impulse. In this context, 'neutralisation' either as compulsive behaviour or cognitive strategies was considered to be 'attempts to avoid or reduce the possibility of being responsible for harm to oneself or others' (p.575). The neutralising usually leads to a reduction in discomfort and the behaviour is reinforced, becoming a strategy for coping with stress (Hodgson and Rachman, 1972; Röper, Rachman and Hodgson, 1973). In accordance with the learning processes hypothesised to underlie behaviour, the probability of subsequent neutralising behaviour is increased and may generalise to other situations. Since neutralising will, almost invariably, be followed by non-punishment (i.e., the feared event did not occur), this would reinforce the validity of the beliefs according to behavioural principles (Gray, 1975), e.g., 'I acted on my belief and felt

better, therefore the belief must have some basis in truth', or 'The disaster I attempted to forestall has not come about, which may mean that my neutralization was a reasonable and effective thing to do'. Neutralisation can also be seen as an attempt avoid or reduce the possibility of feeling guilty for the occurrence of negative events (see Chapter 4). Salkovskis also suggested that completion of the neutralising would be a powerful and unavoidable stimulus, thus perpetuating the cycle as seen in figure 2.2.

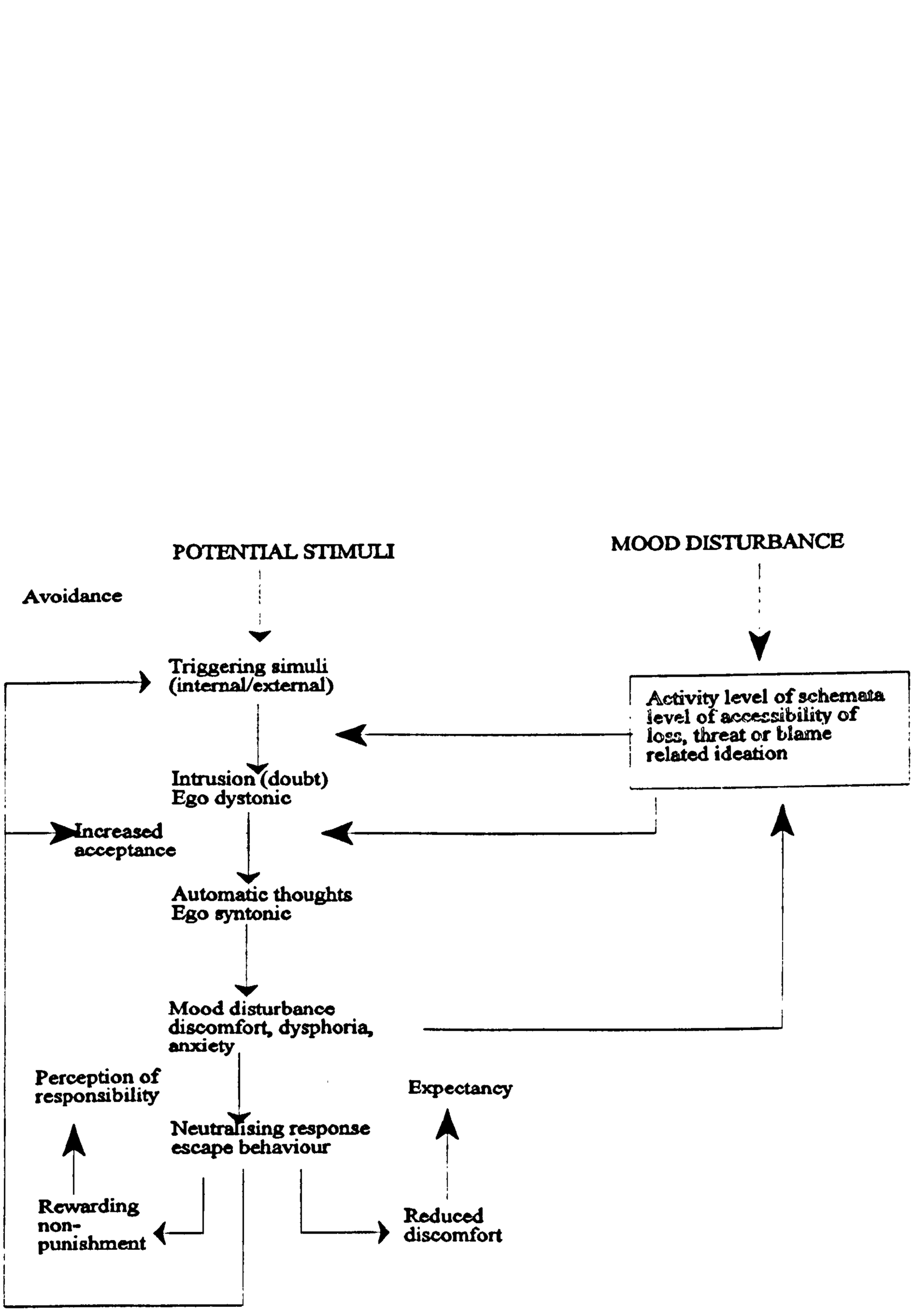


Figure 2.2. Salkovskis's Cognitive-Behavioural Model of OCD (Salkovskis, 1985; 1995).

Although not specified, guilt can be considered as an integral part of this model. Guilt may result from the appraisal of both the occurrence of a negative thought (e.g. `I am a wicked person for having such nasty thoughts'), and also from the appraisal of the negative thought in terms of responsiblility for action. If the person appraises the thought in terms that he/she may be responsible for disaster, guilt may ensue. Furthermore, such people may expect their guilt levels to rocket if they choose to ignore their intrusive thoughts and the threat does occur. In some way, the guilt that may result from failing to act on the intrusive thought may be the same as if they had actually carried out the act themselves (the Omission-Commission Bias; Salkovskis, 1995).

The reformulated cognitive-behavioural model was criticised on the grounds that there was 'theoretical confusion' in the model between negative automatic thoughts and dysfunctional assumptions (Jakes, 1989). In responding to these criticisms, which were argued to result from a failure to consider the key role proposed for neutralising and the significance of the appraisal of responsibility, the model was explored further (Salkovskis, 1989). In particular it was stated that 'It is hypothesised that clinical obsessions are intrusive cognitions, the occurrence and content of which patients interpret as an indication that they may be responsible for harm to themselves or others unless they take action to prevent it' (p.678, original emphasis).

The model has recently been elaborated, particularly with regard to the importance of beliefs relating to responsibility and inaction. Salkovskis identifies 'thinking errors', which are characteristic distortions that influence whole classes of reactions (Beck, 1976). Although not intrinsically pathological, it is suggested that obsessionals show a number of

thinking errors which are associated with their difficulties. Of these thinking errors, the most typical and important is suggested to be 'any influence over outcome=responsibility for outcome'. It is suggested that, unlike the majority of the normal population, obsessional patients hold themselves equally responsible for what they do actively, and also what they fail to do (the omission bias).

Specific aspects of the model (such as the role of religion and guilt) are reviewed in the relevant chapters.

2.7. Evidence for the Cognitive-behavioural reformulation.

Evidence from studies investigating the role of responsibility in OCD, clinical observations, studies from the normal population, studies on thought suppression and cognitive-therapy for OCD is now critically evaluated.

2.7.1. The role of responsibility.

The study by Lopatka and Rachman (1995) provided support for the importance of responsibility in patients with OCD. More detail is given of the experimental design in chapter 5. Lopatka manipulated responsibility in 30 patients with obsessive-compulsive disorder. These patients were predominantly distressed by checking compulsions. Lopatka and colleagues used a within-subjects design and demonstrated that, when subjects were given a high degree of responsibility for their own specific feared negative outcome (e.g. their house would catch fire), then the urge to check, discomfort and anxiety all increased correspondingly. In the condition where the experimenter took responsibility for the feared outcome, the urge to check, discomfort and anxiety were significantly lower than in the

high responsibility condition. In both groups the urge to check, discomfort and anxiety were significantly different from the control condition. One of the major difficulties with this study is the separation of the role of responsibility from that of anxiety, although the possibility that the results can be accounted for in terms of anxiety has now been ruled out (Rachman, 1995; personal communication). Also, whether these findings generalise to other sorts of obsessional behaviour needs to be established. More details can be found in chapter 3.

Psychometric studies have shown responsibility (as measured by the Responsibility questionnaire of Rheume et al., 1995) to be related specifically to measures of obsessive-compulsive phenomenology (Rheume et al., 1995). Although this would be consistent with the reformulated model of OCD, the study was confounded by the fact that the responsibility questionnaire asks questions about responsibility in obsessional situations. It is circular to conclude that people who score highly on this questionnaire have more obsessional symptoms because of increased responsibility, as the only individuals who are likely to perceive any responsibility in these situations are obsessional! The question of the measurement of responsibility is dealt with in more detail in chapter 5.

2.7.2. Clinical observations

Rachman (1993) noted that when patients with OCD came to the clinic, in particular those with compulsive checking problems, they often reported that it was difficult to undergo behavioural therapy, as it was much harder to elicit the urge to check in the clinic than in their own home. Rachman and Hodgson (1980) attributed the failure to elicit discomfort in patients with checking rituals to the fact that 'the presence of another

person, especially someone in a responsible position, apparently inhibits the arousal of discomfort... What seems to happen is this: the subject reasons that the experimenter is unlikely to allow the gas taps, for example, to be left on, and even if they did, then the responsibility for ensuing harm from this act of carelessness would rest with the experimenter, not the subject. If the obsessional subject is divested wholly or partly of responsibility for the act, then he or she experiences little discomfort' (Rachman and Hodgson, p.177). The observation that in-patients displayed little compulsive checking on the ward until they were accustomed to it and began to feel a sense of association, and perhaps responsibility for its security, is also consistent with the reformulated cognitive-behavioural model.

It must be remembered that clinical observation, whilst important, is not always an entirely reliable indication of what may be occurring, and Rachman's interpretations of the behaviours and lack of behaviours are subjective. Furthermore, this information was largely available at the time of the formulation of the theory and may have been used in its construction and therefore cannot be used to support the theory.

2.7.3. Empirical and Psychometric Studies in the Normal Population

These studies are reviewed in Salkovskis (1989). In summary, there is evidence for the following:

- the salience of intrusive thoughts is linked to aversiveness (Edwards and Dickerson, 1987a, 1987b; England and Dickerson, 1988).
- neutralising activity increases the discomfort associated with, and frequency of, intrusive thoughts (Salkovskis et al., 1989).

- there is a link between beliefs concerning responsibility and the occurrence of neutralising (Salkovskis and Dent, 1989).

2.7.4. Thought suppression literature

The reformulated theory states that it is the active attempt to 'suppress' the unwanted thought (because it has been misinterpreted) that leads to an increase in the occurrence of the thoughts. The studies on thought suppression (see Wegner, 1989) show this to be the case, although differences in methodology have led to some studies being difficult to interpret. The effects of thought suppression have recently been linked to the perception of heightened responsibility (Salkovskis, 1995).

2.7.5. Treatment Studies

As in the use of treatment studies to provide evidence for the behavioural model of OCD, treatment studies cannot logically provide evidence to support a model conclusively. However, the failure of clinical applications based on the cognitive-behavioural model would be difficult for the model to explain. Early indications from two controlled studies demonstrated that a cognitive intervention (based on Rational Emotive Therapy along the lines of Ellis, 1962) was as effective as exposure with response prevention based on the behavioural model (Emmelkamp, Visser and Hoekstra, 1988). In a subsequent study, no difference was found between Rational Emotive Therapy and self-

controlled exposure in vivo plus response prevention; a combined package was not found to be superior to exposure in vivo plus response prevention alone (Emmelkamp and Beens, 1991). However, these studies did not use a cognitive-behavioural therapy deriving from Salkovskis's theoretical model. A single case study of treatment of a patient with OCD based on the cognitive-behavioural model was used to illustrate the technique and was effective in the patient described (Salkovskis and Warwick, 1985).

Recently, a controlled treatment trial was undertaken to evaluate therapy based on the cognitive model of Beck and Salkovskis by comparing it to the efficacy of self-controlled exposure in vivo plus response prevention (van Oppen et al., 1995a). The study also compared the efficacy of (1) cognitive therapy without behavioural experiments to (2) exposure in vivo with response prevention without cognitive elements. The cognitive therapy was aimed at modifying (I) overestimation of danger and (II) inflated responsibility in the manner outlined by van Oppen and Arntz (1994).

Twenty-eight patients underwent cognitive therapy, and twenty-nine underwent exposure in vivo for sixteen weekly sessions lasting 45 minutes. Both treatments led to significant improvement both clinically and statistically. There was no significant difference between cognitive therapy and exposure in vivo with response prevention, once initial differences between conditions were taken into account, although the effect sizes on the obsessional measures were all larger in the cognitive therapy than in the exposure condition. Cognitive therapy was as effective as self-controlled exposure in vivo with response prevention. (with six sessions of treatment only). No differences between phenomenological sub-groups (e.g. 'washers' vs 'checkers') were found.

It is somewhat disappointing for the cognitive-behavioural model that therapy based

on it is not more effective than exposure in vivo with response prevention, since one of the motivations for incorporating the cognitive element was the limitations of the effectiveness of behavioural treatment. Furthermore, the drop-out rate was the same in both conditions. Although the treatment study concluded that 'this form of cognitive therapy, which also includes behavioural experiments, may be even more effective than exposure in vivo' the cognitive model predicts that cognitive therapy should be clinically and statistically superior to behavioural treatment which does not address the appraisal of responsibility and overestimation of danger. However, it is possible that future cognitive therapy will become more effective by incorporating recently identified cognitive distortions such as thought-action fusion (see chapter 6) , and other 'thinking errors' (Salkovskis, 1995). It is also possible that cognitive therapy is more effective than exposure in vivo in maintaining gains and preventing relapse as has been found in cognitive therapy for depression and bulimia nervosa (Beck, 1991; Fairburn et al., 1993).

2.7.6. Evidence of the importance of Religion in OCD

Blasphemous obsessions and intrusive thoughts of a religious nature are among the first documented (see Introduction). Despite the strong clinical associations between religion and obsessionality, few empirical studies provide support for such an association. In a review, Fitz (1990) concluded that it was insufficient to look at the religious affiliation of people, and that religious affiliation in itself was not indicative of psychiatric disturbance. A multidimensional definition of religion was suggested in order to determine which particular aspects of religion affect obsessional disorder. The subject of religion, OCD and the cognitive-behavioural model is examined in chapter 4, with consideration

paid to the importance of the moral guidelines provided by religions.

2.7.7. Evidence of the importance of Guilt in OCD

Guilt has often been observed to characterise OCD (Rachman, 1993). However, empirical studies are somewhat confused. For example, although there was an association between obsessional symptoms and guilt levels, guilt levels were not higher in OCD patients than anxiety controls (Steketee, Quay and White, 1991). In some studies, guilt has been found to be a significant predictor of obsessional variables (Niler and Beck, 1986; Watkins, Shafran and Charman, 1995), whereas an attempted replication of the Niler and Beck study failed (Reynolds and Salkovskis, 1991). Much of the confusion can be attributed to poor measures of the assessment of guilt. The relationship between guilt, anxiety and responsibility is of interest and is discussed more fully in chapter 4.

2.7.8 Summary of the Evidence for the Cognitive-Behavioural Model

The cognitive-behavioural model has much evidence in its support. Not only does the evidence in support of the original behavioural theory support the model, but there are data to support the expansion to a cognitive-behavioural framework. Manipulation of responsibility results in changes in obsessional phenomena in the manner predicted by the model. Clinical observation is consistent with the emphasis on the role of responsibility, and empirical studies of the normal population and studies on thought suppression are also fulfilling the predictions made by the model. Cognitive therapy based on the model was not superior to exposure in vivo with response prevention, although it is possible that the effects of the former are more long lasting or that therapy based on recent developments

of the formulation would be more effective. There has been no study to demonstrate directly that appraisal of intrusions in terms of responsibility is the direct cause of obsessional complaints and further investigations are warranted.

2.8. General Comments on the Cognitive-Behavioural Model

Although there is evidence in support of this model, as reviewed above, there are some general criticisms which the model needs to address. Many compulsive behaviours appear to occur without a process of appraisal, for example compulsions involving order, number and touching (Tallis, 1995). Some patients do not report appraisals but rather state that things just 'have to be' that way until something 'feels right' whilst acknowledging that a failure to undertake the behaviours would have few negative consequences. Children with OCD in particular do not readily put forward cognitive explanations for their difficulties, which appear to be experienced as an inability to stop performing an action (Rapoport, 1990) It is possible to suggest that the appraisal process has become `automatic' and no longer available to conscious awareness, but such an explanation is not testable and therefore lacks utility in the testing of theories by empirical investigation. However, one case in this thesis (JB) reported compulsive activity without any appraisal or the experience of anxiety. When his compulsive activity was interrupted, to his surprise, he reported feelings of anxiety, although he could not specify the cause. It may be, therefore, that through repetition, behaviours become automatic and the original motivation and appraisals become difficult to report.

Other difficulties arise when considering the current model to be a complete account of the formation and maintenance of all obsessional problems. There are many people who

feel excessive responsibility and yet have no psychiatric difficulties. Excessive responsibility and guilt are also a key feature of depression (Beck, 1967). Similarly there are many people with high moral standards who may have the 'dysfunctional assumptions' and 'thinking errors' suggested by Salkovskis, yet do not have obsessional behaviours. The links between the appraisal of intrusions and the manifestation of compulsions (some of which can be bizarre) are not fully explained by the theory. Finally, neurological dysfunction in OCD is not addressed by this model, despite the apparent strength and diversity of evidence in support of a neurological model of the disorder.

2.9. Summary of the Cognitive-Behavioural Model of OCD

This chapter has detailed the behavioural model of OCD. This model applies learning theory to the development of obsessions and compulsions. Anxiety is a core feature of this model and avoidance serves to maintain the disorder. A wide variety of evidence supports the model, but there is room for further improvements owing to limitations which were described. The incorporation of cognitive elements into the model was aimed at improving the conceptual understanding of the disorder and its treatment. The most well developed cognitive-behavioural model suggests that appraisal of normal intrusions in terms of `responsibility' is important to the disorder. There is evidence to support this model, although treatment based on the model was not more effective than behavioural treatment without a cognitive element. The data in support of the model and the potential for the improvement of therapy for OCD based on its principles, warrants further empirical investigation of the cognitive-behavioural model.

CHAPTER 3

The Nature of Anxiety in People with OCD

"Often I dream that I am incontinent and wake in a total panic and have to check the bed, the entire floor, my bottom with a mirror many times and then I am afraid to sleep again in case it happens again" (KW).

"To protect myself I use avoidance, e.g., I never visit my local town centre; I communicate with my contaminated brother only by phone; I gave up my job (in the town centre); I keep people out of my house; I don't answer the door" (SL).

3.1. Introduction

The previous chapter detailed the behavioural model of OCD and the recent development of the cognitive component of the model. The reformulated cognitive-behavioural model places anxiety at its core. Anxiety is considered to be at the heart of the formation of the disorder via conditioning, and avoidance by neutralising (compulsive behaviour) is suggested to maintain the disorder (Rachman and Hodgson, 1980). Cognitive and psycho-physiological components were included in the three systems analysis of the disorder (Rachman and Hodgson, 1980). The purpose of the study in this chapter was to investigate further the nature of the anxiety that characterises an obsessional population.

3.2. Anxiety and the Heterogeneity Hypothesis

In the introductory chapter, reference was made to the two aims of the studies in this thesis. The first aim is to investigate and develop the cognitive-behavioural model, and the

second aim is to generate data to test the hypothesis that different sub-groups may exist, one characterised by anxiety, responsibility and guilt and the other by neurological deficits. Anxiety is at the core of the cognitive-behavioural model of OCD and yet is not considered important by the neurological theorists, who fail to mention anxiety disorders even within the hypothesized spectrum of disorders (Hollander, 1993). Nevertheless, exposure with response prevention is still considered to be an important treatment of such obsessive-compulsive 'related' disorders (Josephson and Brondolo, 1993). The data generated in this study are used to test the heterogeneity hypothesis in chapter 9.

3.3 Study to Investigate the Nature of Anxiety in An Obsessional Population.

3.3.1. Background

The behavioural model of OCD considers anxiety to be important both for the formation of obsessional difficulties via conditioning, and for the maintenance of the disorder by avoidance of anxiety through compulsive activity (see previous chapter). `Fear of fear' is also considered as an important maintaining factor (Rachman, 1990). Anxiety can be measured in different ways, and one of the most common is to administer self-report ratings of standardised measures such as the Beck Anxiety Inventory. No study has reported scores on the Beck Anxiety Inventory with a large number of obsessional subjects, i.e. n>30. The three-systems model of anxiety described in the previous chapter (Rachman and Hodgson, 1980) can be tested by use of a questionnaire designed specifically to assess the three components of anxiety. In this questionnaire, the `cognitive' component is separated into `negative affect' and `cognitive' components, thus providing a measure of `four systems' of anxiety. Although the instrument has good psychometric properties, it is in need of further development (Koksal and Power, 1990; Koksal, Power and Sharp, 1991). In particular, the

prediction that people with OCD score more highly on all components needs to be examined using an adequately sized sample as the OCD sample used by Koksal et al. (1991) had only 8 patients.

Information regarding the `fear of fear' aspect of the model, could be tested by administering the`Anxiety Sensitivity Index', a measure designed specifically to assess the fear inducing properties of anxiety (Taylor et al., 1992). Anxiety sensitivity has been defined as 'the fear of anxiety-related sensations, which arises from beliefs that these sensations have harmful somatic, psychological or social consequences' (Taylor, 1995; Reiss, 1987). During the course of the thesis, data have been published showing that a large Canadian sample of OCD subjects scored more highly on this measure than healthy controls (Taylor et al., 1992). Recently, the theoretical and empirical findings relating to anxiety sensitivity, or 'fear of fear', have been reviewed (Taylor, 1995). It was concluded that anxiety sensitivity was a unitary construct at a higher-order level, and may be multidimensional at a lower-order level (corresponding to fear of somatic harm, psychological harm and social harm). Anxiety sensitivity is thought to particularly characterise patients with panic disorder, it is distinct from other fears and is distinct from trait anxiety (although the two are related). The questionnaire has not been administered in a British sample.

Neither the `Four Systems Anxiety Questionnaire' nor the `Anxiety Sensitivity Index' has been related to obsessional symptoms within an obsessional population. Although not explicitly stated in the behavioural model, it is implicit that obsessional symptoms as measured by the Padua Inventory (Sanavio, 1988) or the MOCI (Hodgson and Rachman, 1977, although see later for a discussion as to severity) would be related to all the measures of anxiety described above.

3.3.2. Aims

There were two primary aims to this study. The first aim was to test the hypotheses and predictions made by the behavioral model about the nature of anxiety in an obsessional population. The second aim was to provide data to test the heterogeneity hypothesis (see Chapter 9). Only data relevant to the first aim of the study will be reported in this chapter.

3.3.3. Hypotheses and Predictions

Hypothesis 1

People with obsessional difficulties will show more anxiety of a clinical nature than a normal population.

Prediction 1

An obsessional population will score significantly higher on the Beck Anxiety Inventory than data published for the normal population.

Hypothesis 2

Anxiety in people with obsessional difficulties has more than one component, including cognitive, behavioural and psycho-physiological components. An obsessional population will show more of each of these components than a normal population.

Prediction 2

An obsessional population will score significantly higher on each of the subscales of the Four Systems Anxiety Questionnaire than data published for the normal population.

Hypothesis 3

Fear of fear will characterise an obsessional population more than a normal population (see p. 43)

Prediction 3

An obsessional population will score significantly higher on the 'Anxiety Sensitivity Index' than data published for the normal population.

Hypothesis 4

The extent of anxiety will be related to the severity of obsessional symptoms

Prediction 4

There will be a significant correlation between measures of obsessionality and measures of anxiety.

3.3.4. Methods

Subjects

Subjects were recruited from three sources.

1) Six subjects were patients who had been referred to Professor Mark's Behavioural Treatment Unit at the Bethlem Royal Hospital, Kent.

2) Seven subjects were members of a self-help group for people with OCD in Surrey.

3) Thirty-six subjects were those who:

- Responded to an advertisement on the radio or in a woman's magazine asking for help with research into OCD

- They had returned their screening questionnaires and had a score of 11 or more on the Maudsley Obsessional Compulsive Inventory (MOCI; Hodgson and Rachman, 1977), i.e. in the clinical range.
- They were all willing to travel to the Institute of Psychiatry for an assessment.

Two of the sample did not meet DSM-III-R criteria for OCD and hence their data were excluded from the analysis. The remaining 47 subjects met DSM-III-R criteria for OCD (American Psychiatric Association, 1987). Since these criteria are more stringent than those of DSM-IV (American Psychiatric Association, 1994), all these subjects would have fulfilled the current diagnostic criteria of DSM-IV. One or two subjects failed to complete some questionnaires; therefore the number of subjects who completed the questionnaires varies between n=45 (FSAQ) and n=47 (ASI).

The data from the current sample with OCD are compared with published norms for scores on the questionnaires.

Sample Characteristics:

The mean age of the OCD sample was 36.3 years (sd 9.46; range 23-70). 29 (61.7%) were female, 18 (38.3%) were male. The mean duration of the illness was 15.27 yrs (range 1-50 yrs; sd 11.62). The overall average age of onset was 20.87 yrs (range 4-40 yrs; sd 10.37). Age of onset for women was 19.48 (range 5-39 yrs; sd, 10.52) and for men was 21.17 yrs (range 4-40 yrs; sd 10.63). 24 subjects (51.1%) were known to be on medication at the time of the study; 10 of these were taking clomipramine. Twenty seven of the 47 subjects (57%) reported that their obsessional intrusions occurred somewhere between several times a day and `all the time'. On a scale corresponding to 0 'Not at all' to 8 'Very Severely, I can't

cope', the mean interference with work was reported as 3.9 (sd 2.0), interference with home management was reported as 4.14 (sd. 4.14) and the mean interference with social activities was 3.88 (sd. 2.10), all of which correspond to a definite impairment. The most common single obsession concerned fear of harming others (17%). 20/47 (42.6%) reported a combination of compulsions (checking, washing etc), 6 subjects had checking rituals only and the remainder had washing, symmetry or mental rituals.

Measures

For Prediction 1:

The Beck Anxiety Inventory: (BAI: Beck, Brown, Epstein and Steer, 1988). This is a 21-item scale comprising symptoms of anxiety. The scale measures the severity of anxiety in adults and children; symptoms are rated on a 4-point scale ranging from 0 ('not at all') to 3 ('severely: you could barely stand it). This measure is considered to assess clinical anxiety more accurately than other measures, such as Spielberger's measure of trait anxiety (Spielberger et. al., 1980).

For Prediction 2:

The Four Systems Anxiety Questionnaire: (FSAQ: Koksal and Powers, 1990). This is a 60-item self-report inventory. Subjects report whether they have experienced any of the thoughts, feelings, physical symptoms, or behaviours in the manner indicated by the items. Some items are reverse coded and subjects' scores are calculated by adding the scale values of the items with which they agreed.

For Prediction 3:

The Anxiety Sensitivity Index: (ASI: Taylor, Koch and McNally, 1992). This is a 16-item, self-report inventory in which subjects are requested to rate the extent to which they agree with each item on a 5-point Likert scale. The scale ranges from 0 ('very little') to 4 ('very much'). The total score ranges from 0 to 64 and is obtained by summing the item scores.

For Prediction 4:

Padua Inventory - Revised: (P I-R; Sanavio, 1988; van Oppen, 1995c). This is a 41-item list of common obsessional thoughts and compulsive behaviours (see appendix 1). It was revised from an earlier 60-item list. Each of the 41 items is rated on a five-point scale in terms of the frequency with which they are experienced. The scale points are labelled from `not at all' (score of zero) to `very much' (score of four). All items are negatively phrased (`I feel my hands are dirty when I touch money'). An investigation into the factor structure of this measure for a British obsessional population can be found in appendix .

Maudsley Obsessional Compulsive Inventory: (MOCI; Hodgson and Rachman, 1977). This is a 30-item questionnaire. Subjects are requested to respond `TRUE' or `FALSE' to each item. There are four subscales: checking, washing, doubting and slowness.

Procedures

The questionnaires were given to subjects who indicated that they were willing to participate in a research project investigating OCD. The questionnaires were sent to the subjects' homes and returned when the subjects attended the Institute of Psychiatry for an appointment. The questionnaires were completed as part of a larger assessment package.

3.3.5. Results

Prediction 1:

Descriptive statistics for the BAI total scores are presented in Table 1.

Table 3.1. Scores on the Beck Anxiety Inventory

Group	n	Mean	SD
Normal (non-students; Dent and Salkovskis, 1986)	36	7.78	5.65
OCD (this sample)	46	19.07	9.74
OCD (Beck et al. 1988)	26	21.69	12.42
Panic Disorder with Agoraphobia (Beck et. al. 1988)	95	27.27	13.11

Assuming homogeneity of variance, a one-way ANOVA was conducted to determine whether there were any significant differences between the OCD group in the present study and subjects with Panic Disorder with Agoraphobia and healthy controls for whom there are published norms (detailed in Table 3.1). The analysis showed a significant overall difference between the OCD subjects, subjects with Panic Disorder with Agoraphobia and healthy controls

(F (2,174)=48.2, p<0.001) thereby indicating that it was appropriate to conduct independent t-tests to identify differences between 2 specific groups.

Therefore independent t-tests were conducted to compared the mean BAI scores of the present sample to published norms for other clinical groups and for non-clinical subjects. The current OCD sample was significantly more anxious than the normal population (t=6.1, p< 0.01). There was no significant difference between BAI scores in the current sample and scores of subjects with OCD in the Beck et al. (1988) study (t=0.43, p>0.05). The current OCD sample had significantly lower BAI scores than the scores reported by Beck et. al. for patients with panic disorder with agoraphobia (t=3.78, p <0.01).

Prediction 1 was fulfilled.

Prediction 2:

Descriptive statistics for the FSAQ are presented in Table 3.2.

Table 3.2. Scores on the Four Systems Anxiety Questionnaire

Group	n	Mean and SD				
		FSAQ Feeling	FSAQ Cognitive	FSAQ Behaviour	FSAQ Somatic	FSAQ Total
Normal University Students (Koksal et al. 1991).	218	17.3 (14.02)	23.98 (18.2)	20.08 (13.05)	18.89 (11.98)	20.21 (11.77)
OCD (this sample)	45	54.17 (17.7)	64.48 (15.64)	35.71 (16.43)	33.36 (18.38)	46.93 (12.62)
OCD (Koksal et al. 1991)	8	40.3 (13.1)	68.6 (11.7)	24.4 (16.3)	32.0 (13.8)	41.3 (9.2)
Other Anxiety Disorders (Koksal et al. 1991)	10	54.6 (20.3)	59.8 (17.7)	36.2 (22.6)	52.5 (18.3)	50.8 (17.8)

It is not possible to assume that the data from subjects with OCD and other anxiety disorders in the Koksal et al. (1991) study are normally distributed owing to the small sample sizes, and it is unlikely that the variance is homogeneous among the different groups.

Therefore, comparisons were made only between the subjects with OCD in this sample and normal university students. It was not possible to do a Hotelling's T^2 to determine whether there were significant overall differences between two groups on the individual subscales, as the raw data were not available from the study of Koksal and colleagues. Therefore an independent t-test was used to compare Total FSAQ scores on each of the components of the FSAQ between the present sample of OCD subjects and the published data for normal university students. The Total scores were greater for the present sample of OCD subjects than for non-clinical controls ($t=13.7$, $p<0.001$). Therefore comparisons were made on scores on the subscales for OCD subjects using independent t-tests. These were all significantly higher for OCD subjects than healthy controls ($p<0.001$).

Prediction 2 was fulfilled.

Prediction 3

Descriptive data are given in Table 3.3. below:-

Table 3.3. Scores on the Anxiety Sensitivity Index

Group	n	Mean	SD
Normal (Taylor et al. 1992)	1013	17.8	8.8
OCD (this sample)	47	26.74	12.73
OCD (Taylor et al. 1992)	67	25.4	12.4
Panic Disorder (Taylor et al. 1992)	151	36.6	12.3

Given the difference in sample sizes, it was not appropriate to conduct a one-way ANOVA since homogeneity of variance could not be assumed. Therefore an independent t-test was used to compare ASI scores between the present sample of OCD subjects and the published data. ASI scores were significantly greater for the present sample of OCD subjects than for non-clinical controls ($t=6.6$, $p<0.01$); ASI scores were significantly lower for OCD subjects than for patients with Panic Disorder ($t=-4.8$, $p<0.01$) and there was no significant difference between ASI scores for the present OCD sample and the Canadian OCD sample ($t=0.56$, $p>0.05$)

Prediction 4

Pearson's correlation coefficients were computed to determine the association between scores on measures of obsessionality and measures of anxiety. The correlation coefficient matrix is shown in Table 3.4. Significance levels were set at $p<0.001$, as multiple correlations were being computed.

Table 3.4. Correlation Coefficient Matrix for Anxiety and Obsessional Variables

	Maudsley Obsessional Compulsive Inventory (n=46)				
	TOTAL	CHECK	WASH	DOUBT	SLOW
ASI TOTAL	.4331**	.4585**	.3664	.0096	.1821
Beck Anxiety Inventory	.1994	.2341	-.0172	.1824	.1821
Four Systems Anxiety Questionnaire					
FEELINGS	.1946	.1977	.1361	-.1265	.1978
COGNITION	.1346	.2584	.0372	-.0504	-.0579
BEHAVIOUR	.2228	.1498	.2750	.1045	-.0453
SOMATIC	.2564	.0299	.1856	.1424	.2072
TOTAL	.2734	.2068	.2147	.0262	.1088

	PADUA (n=46)					
	IMPULSES	WASHING	CHECK	RUMINATE	PRECISION	TOTAL
ASI TOTAL	.4013**	.3397	.4131**	.4104**	.1427	.5117**
Beck Anxiety Inventory	.2573	-.0132	.0673	.2987	.2333	.2276
Four Systems Anxiety Questionnaire						
FEELINGS	.4304**	.1198	.0535	.5473**	.0645	.4030**
COGNITION	.3748	.0433	.1891	.5429**	-.0654	.3625
BEHAVIOUR	.2099	.3125	.1520	.3299	.0453	.3150
SOMATIC	.2272	.0098	-.0474	.1457	.2230	.1921
TOTAL	.4036**	.1542	.1081	.5015**	.0931	.4074**

The correlation coefficient matrix showed a significant positive correlation between the total number of obsessional symptoms (as measured by the MOCI and the PI-R) and the Anxiety Sensitivity Index ($r=0.43$ and $r=0.51$ respectively, $p<0.001$). The FSAQ was associated with total number of obsessional symptoms as measured by the PI-R.($r=0.41$, $p<0.001$) and the subscale to assess feelings was also associated with the PI-R total ($r=0.4$, $p<0.001$). The rumination subscale of the PI-R was associated with several different indices of anxiety, most notably the cognitive and feeling subscales of the FSAQ ($r=0.55$ and $r=0.54$ respectively, $p<0.001$). Of note, anxiety as measured by the BAI was, surprisingly, not correlated with measures of obsessionality.

Prediction 4 was partially fulfilled.

<u>Summary of Results</u>

Prediction 1 was fulfilled.

Prediction 2 was fulfilled.

Prediction 3 was fulfilled.

Prediction 4 was partially fulfilled.

Obsessionals had significantly more anxiety than in a normal population, their anxiety was higher on all four systems (cognitive, feeling, somatic and behavioural) and they showed significantly more `fear of fear' than a normal population (although less than patients with Panic Disorder). Prediction 4 was only partially fulfilled as some of the measures of anxiety were associated with measures of obsessionality, but others were not.

There was support therefore for the following hypotheses:-

Hypothesis 1 - People with obsessional difficulties showed more anxiety of a clinical nature than a normal population.

Hypothesis 2 - Anxiety in people with obsessional difficulties has more than one component, including cognitive, behavioural and psycho-physiological components. An obsessional population showed more of each of these components than a normal population.

Hypothesis 3 'Fear of fear' characterised an obsessional population more than a normal population.

There was partial support for the fourth hypothesis.

Hypothesis 4 The extent of anxiety was related to the severity of obsessional symptoms, but only with respect to some measures of obsessionality.

3.3.6. Discussion

This is the first study to examine closely the nature of anxiety within a population with OCD, in particular the different systems, and to relate the systems to measures of obsessionality. The results provide support for the behavioural model of OCD. Anxiety does characterise the disorder in that people with OCD show significantly more anxiety than healthy controls. The negative findings are perhaps, most worthy of discussion, in particular the lack of a relationship between anxiety as measured by the BAI and and obsessional symptoms, and the lack of an association between the measures of four systems of anxiety and the MOCI scores.

It is possible either that:

1) There is an association between the severity of obsessionality and extent of anxiety

but the instruments have failed to detect it.

2) There is no association between the severity of obsessionality and the extent of anxiety.

3) The sample is too small and restricted to answer the questions adequately.

One reason that the instruments may have failed to detect the relationship between severity of obsessionality and the extent of anxiety is that the MOCI does not seem to be particularly sensitive to the severity of symptoms within an obsessional population. Although the MOCI is sensitive to treatment effects (Taylor, 1995), there is no measure of severity within the instrument. Therefore it is not able to distinguish between severely impaired people with OCD and people with OCD who are less impaired but have the same concerns and behaviours. Some evidence in support of this suggestion comes from the lack of association between the MOCI and the Compulsive Activities Checklist (Philpott, 1975). This measure determines the extent of interference caused by obsessional symptoms, but was not found to correlate highly ($r=0.29$) with the MOCI score within a normal population (Sternberger and Burns, 1990). The lack of sensitivity to symptom severity is not a failing of the MOCI per se, as it was never intended to discriminate between the severity of the problem within a clinical population, but is a possible reason that the MOCI scores do not correlate with a measure of anxiety.

However, the PI-R is sensitive to change with treatment (van Oppen et al., 1995b) and, given that there is a scale to measure the frequency of the obsessions and behaviours, it should be able to distinguish severity of symptoms within an obsessional population. Nevertheless, there was no significant correlation between the PI-R score and score on the

BAI. It is plausible, therefore, that the results are valid and there is no association between the severity of anxiety (as measured by the BAI) and the severity of obsessional symptoms.

This lack of an association does not mean that anxiety is not part of OCD but could be explained by a `ceiling' effect. It may be that a certain level of anxiety is necessary for the formation and/or maintenance of OCD, but that it is not the case that the more anxiety, the worse the symptoms. People may have different thresholds for the tolerance of anxiety so that for one person, a small amount of anxiety is sufficiently aversive to promote associations between unrelated events (as in classical conditioning) and to motivate avoidance behaviours. More anxiety need not necessarily lead to more aversion and stronger (mis) associations, and it may not increase avoidance behaviours if the anxiety level has already reached a maximum level for that person (the `ceiling'). Another person may need to experience much more anxiety before associations are made between cognitions and events, and before compulsive behaviour is initiated and OCD develops and is maintained.

Overall, the results are consistent with the behavioural model that proposes that anxiety characterises OCD. Given that anxiety characterises other disorders such as Panic Disorder which are distinct from OCD, obsessionality cannot merely be construed as just extreme anxiety. More information about the nature of obsessional symptoms within an obsessional population is needed to be able to construct hypotheses about what may **uniquely** characterise people with OCD and distinguish them from other people.

3.4. Summary

This study investigated the nature of anxiety in people with OCD. Compared to

published data, the obsessional population had significantly higher scores on all measures of anxiety including general clinical anxiety, behavioural anxiety, cognitive anxiety, psycho-physiological anxiety, negative affect and sensitivity to anxiety ('fear of fear'). There was a significant association between many, but not all, of these measures of anxiety and the severity of obsessional symptoms.

CHAPTER 4

Guilt and Religion in OCD

'I advise all...to take heed of placing Religion too much in Fears, and Tears, and Scruples' (Richard Baxter, Reliquiae Baxterianae, 1696).

'One might venture to regard obsessional neurosis as a pathological counterpart of the formation of a religion, and to describe that neurosis as an individual religiosity, and religion as a universal obsessional neurosis' (Freud, 1907/1961, pp126-127).

'I was brought up as a Catholic with very strict parents. Thought was as bad as deed. I was told to confess bad thoughts. Guilt plays a major part in my life. Constantly it seems that anything important, I have doubts about and subsequent guilt. The more I suppress the thoughts, the more they come back at me. When this started, I remember waiting at the age of 7 outside a confessional box, not being able to convince myself whether I was sorry or not for my sins. Although I was sorry, my conscience was telling me I wasn't and until I could convince myself that I was sorry, I couldn't go in the confessional box' (FC. Punctuation amended).

4.1. Introduction

In the previous chapters, the cognitive-behavioural model of OCD was detailed, and the role of anxiety investigated in a questionnaire study. The first half of this chapter considers the importance of guilt and obsessionality. The role of guilt within the cognitive-behavioural model is reviewed and the relevance of guilt for the heterogeneity hypothesis is outlined. The literature on guilt in OCD is reviewed. A second questionnaire study on the

relationship between guilt and obsessionality in an obsessional population is reported. Religious instruction may be one reason that people with obsessional complaints feel guilty. The second half of this chapter considers the importance of religion and obsessionality. Religion is discussed within the context of the cognitive-behavioural model and the relevance of religion for the heterogeneity hypothesis is outlined. The clinical picture of religious obsessions is presented and the literature on the role of religion in OCD is briefly reviewed. A large questionnaire study on the relationship between religion and obsessionality in an obsessional population is described, and the findings discussed with reference to the cognitive-behavioural model.

4.2. Guilt and the cognitive-behavioural model

There are many definitions of guilt, most of which involve a negative emotion with an accompanying recognition that one has done something wrong (Arnold, 1970; Demaria and Kassinove, 1988). Guilt is closely related to responsibility, since guilt is the emotion that is most likely to result from an appraisal of responsibility for a negative outcome. Guilt is suggested to serve both as a factor predisposing to obsessional difficulties, and as a factor which perpetuates the problem. Feelings of guilt (related to the appraisal of responsibility) would serve to motivate a person to avoid the relevant thoughts or actions and make restitution if avoidance fails.

As well as serving as a motivator to act upon appraisals of responsibility, guilt may also predispose to the development of the problem. A person may have dysfunctional schemata which relate to guilt, for example 'if bad things happen, I will feel guilty because I should have acted to prevent it.' When an intrusive thought occurs relating to harm of a loved one, such dysfunctional schemata are activated, according to the model, and negative

automatic thoughts involving an appraisal of responsibility may occur. For example, I am responsible for making sure my loved one is safe, so 'if my loved one is harmed, I will feel guilty because I should have acted to prevent it'. A person without dysfunctional schemata concerning responsibility relating to guilt is less likely to make an appraisal, since there are no latent concepts about guilt resulting from failures to act.

4.3. Guilt and the Heterogeneity Hypothesis

The cognitive-behavioural model suggests that guilt may serve as both a predisposing and perpetuating factor in obsessionality. An inflated sense of responsibility, which is central to the model, is closely related to intense feelings of guilt; in turn, intense feelings of guilt could contribute to the hypothesised misappraisal of intrusions. If some people have a `neurological' form of OCD, there is no reason to predict that their guilt levels will be elevated compared to non-clinical norms. However, those whose obsessionality is better accounted for by the cognitive-behavioural model are predicted to have elevated levels of guilt compared to non-clinical controls.

The heterogeneity hypothesis is tested with respect to guilt in chapter 9. It is worth noting that if the heterogeneity hypothesis is supported, discrepancies found in empirical studies of guilt can be understood in terms of the heterogeneity of the disorder.

4.4. The Clinical Picture of Guilt and OCD

Invariably, guilt is described as a major part of obsessional complaint. In DSM IV (APA, 1994), guilt is mentioned as an `associated feature' of the disorder. 'Guilt and anxiety are the dominant affective symptoms' according to a recent phenomenological study (Rasmussen and Eisen, 1991). A patient is described by Rachman (1978) as having intrusive

thoughts that 'provoked considerable discomfort and guilt'. A person may feel guilt for having 'bad thoughts', and many of the subjects in the study reported feelings of guilt about their thoughts and their actions. Examples from these subjects are given below:

'[On the interruption of a ritual] I went berserk and told my father that I hated him which of course for me, considering myself a Christian..was a dreadful thing to say. The guilt was awful..my rituals increased' (PL)

'I always felt guilty about things - always thought I would be in trouble over everything..I didn't realise I had feelings of guilt until I was about 25 or 26 years old, and then I knew that from age 2, when my mother left, I had been blaming myself for her leaving and had been feeling guilty ever since' (AS)

Guilt is also a characteristic of depression (see Beck, 1976). Since depression also characterises OCD (see Rachman and Hodgson, 1980), it can sometimes be difficult to determine whether the guilt is related to obsessional or depressive features of the illness. Some differences between obsessional guilt and depressive guilt are discussed in section .

4.5. A review of the literature on Guilt and OCD

Originally, the Old English term `gylt' meaning `crime, debt or fine' did not refer to any feelings experienced by the culprit (see Berrios et al., 1992). European equivalents of the term, referred to 'doing wrong', the act of rule breaking, but not to any feelings of remorse. The term gradually grew to incorporate the action of moral self-scrutinising and the feelings of uneasiness that accompany transgression of moral codes.

'Guilt may be defined as the dysphoric feeling associated with the recognition that one has violated a personally relevant moral or social standard' (Kugler and Jones, 1992). This definition is similar to Beck's (1976) conclusion that guilt results from a perceived transgression of one's own internal rules. 'Tangney et al. (1992) have distinguished guilt from shame on the grounds that 'In guilt, the object of concern is some specific action (or failure to act). There is remorse or regret over `the bad thing that was done' and a sense of tension that often serves as a motivation for reparative action...In shame, the object of concern is the entire self. The `bad thing' is experienced as a reflection of a `bad self' and the entire self is painfully scrutinized and negatively evaluated' (Tangney et al., 1992). In an extensive review of the literature, Kugler and Jones (1992) have examined the different definitions, consequences, theories and measurement of guilt.

When blame is assigned externally, anger may result, and when it is assigned internally, guilt may be experienced (Dryden, 1994). The attempt to avoid self-directed blame or criticism was put forward as a possible explanation for some checking compulsions, for example 'the underlying motive in all of these examples is the attempt to avoid punishment in the form of criticism either from others, or self-directed criticism i.e. guilt. Where the cleaners are mainly trying to avoid coming into contact with danger, discomfort or fear, the checkers are mainly taking steps to avoid criticism or guilt' (Turner et al., 1978). Following from this, in checkers, a failure to avoid criticism or guilt would lead to an increase in checking behaviour, in order to prevent further criticism or guilt. Further, 'checkers should also experience more intense and more frequent feelings of guilt than do cleaners....Also, doubters should experience more intensive and frequent feelings of guilt than do cleaners' (Rachman, 1993). The latter statement is based on the closer association between checking and doubting, than between cleaning and doubting (Rachman and Hodgson, 1980).

Despite the long history of clinical documentation of the prominence of guilt in OCD, there has been relatively little research in this area. Owing to space limitations, this review excludes the following related areas:

1) the relationship between guilt and OCD via the associations between guilt in depression, and depression and OCD.

2) the relationship between guilt and OCD via perfectionism

3) an analysis of the theoretical relationship between guilt, responsibility and control (see Salkovskis, 1989, and Shaver and Drown, 1986 for further discussion of this interesting relationship).

The brief communication of Turner and colleagues (1976) reported that people with checking compulsions showed more sensitivity to criticism than washers or phobics. However, guilt was not assessed directly. Niler and Beck (1989) used the Perceived Guilt Index (PGI; Otterbacher and Munz, 1973) to investigate the relationship among guilt, dysphoria, anxiety and obsessions in a normal population. This study found that the PGI was the best predictor of negative intrusive thoughts and impulses. The first attempted replication of this study in a normal population failed - guilt did not strongly influence the experience of negative intrusive thoughts, but levels of self-reported depression and anxiety did (Reynolds and Salkovskis, 1991).

Steketee, Quay and White (1991) used a situational measure of guilt which assessed guilt in the domains of interpersonal harm, norm violation and self-control failure (Klass, 1987). Thirty three patients with OCD were compared to 24 patients with anxiety disorders and, contrary to expectations, there were no differences on any of the domains of guilt between these two groups. However, significant correlations were found between the extent

of guilt and the extent of pathology in OCD subjects (as measured by the MOCI). Significant associations were also found between the extent of guilt and religiosity in OCD patients, but not in anxious controls. Subclinical obsessive-compulsive subjects were recently found to have significantly higher scores on all domains of guilt than non-compulsive subjects using this situational measure (Frost et al., 1994).

However, Klass's situational measure of guilt is long to complete and rather cumbersome. A new self-report measure of guilt has recently been developed by Kugler and Jones (1992) with three subscales - state guilt, trait guilt and guilt standards. In a non-clinical population, the level of trait was found to be a significant predictor of obsessionality (as measured by the MOCI), but guilt standards, state guilt, depression and anxiety were not (Watkins, Shafran and Charman, 1995).

In summary, the research literature, is in a state of confusion. There does appear to be a relationship between obsessionality and guilt, but patients with OCD did not report more guilt than anxious controls; two studies have found that in the normal population, guilt was the best predictor of intrusions, another found that it was not at all significant in predicting intrusions. Most recently, subclinical obsessive compulsives were found to have more guilt than non-compulsives in all domains. In the most recently published book on OCD, Tallis (1995) states that ' there is considerable evidence suggesting that guilt is a significant phenomenological feature of OCD' .

4.6 A study of guilt and obsessionality

4.6.1. Background

Based on the associations between responsibility and guilt, it has been suggested that

people with checking compulsions and `doubters' will experience more guilt than people with cleaning compulsions (Rachman, 1993). People with obsessional difficulties have been suggested to be of `tender moral conscience'. Such high morality has been suggested as a means by which normal intrusive thoughts assume `special significance' (Salkovsksis, 1985).

Two of three studies using normal subjects have found that some form of guilt is a predictor of obsessionality (Niler and Beck, 1989; Watkins, Shafran and Charman, 1995), but a third - using the largest subject sample - did not (Reynolds and Salkovskis, 1991). Instead, this large study found depression and anxiety to be the best predictor of obsessionality as measured by the MOCI; however the other studies (Niler and Beck, 1989; Watkins et al. 1995) did not find depression or anxiety to be a significant predictor of obsessionality. Only one study has examined guilt in an obsessional population and the results produced were themselves contradictory and difficult to interpret (Steketee et al., 1991). The sample size was small (n=33) and the authors suggested the need for 'further research establishing the pervasiveness and severity of guilt in OCD'.

4.6.2. Aims

There were three aims in the present study.

1) To determine the relationship between guilt and obsessionality, taking into consideration depression and anxiety.

2) To determine differences in guilt among `checkers', `cleaners' and`doubters'

3) To collect data to test the heterogeneity hypothesis (See Chapter 9).

The following describes data relating to the first two aims of the study. The heterogeneity hypothesis is tested, in part, using data from this study and is described in chapter 9.

4.6.3. Hypotheses and Predictions

Hypothesis 1

Guilt is associated with obsessionality.

Prediction 1a

An obsessional population will have more guilt (and higher moral standards) than a non-obsessional population.

Prediction 1b

Measures of guilt will be correlated with measures of obsessionality.

Hypothesis 2

The relationship between guilt and obsessionality is affected by depression and anxiety.

Prediction 2

The correlations between guilt and obsessionality will be reduced by controlling for the effects of depression and anxiety.

Hypothesis 3

Guilt, depression and anxiety are significant predictors of obsessionality.

Prediction 3

In regression analyses, guilt, depression and anxiety will predict scores on measures of obsessionality.

Hypothesis 4

`Checkers' and `doubters' show more guilt than `cleaners'.

Prediction 4

`Checkers' and `doubters' will score significantly more highly than `cleaners' on the measure of guilt.

4.6.4. Method

Subjects

Subjects were recruited in the same manner described in chapter 3. Approximately 200 sets of questionnaires were sent out. 108 usable replies (54%) were received. The mean age of the sample was 36.3 years (sd=11.07; age range 18-70). 82.4% of the sample were female (n=89).

Measures

Guilt Inventory: (GI; Kugler and Jones, 1992). This is 45 item self-report inventory designed to assess the following domains: trait guilt, defined as a continuing sense of guilt beyond immediate circumstances (e.g., 'Guilt and remorse have been a part of my life for as long as I can recall,' 'I often have a strong sense of regret,' and 'Frequently I just hate myself for something I have done'); state guilt defined as present guilty feelings based on

current or recent transgressions, (e.g., 'At the moment, I don't feel particularly guilty about anything I have done,' 'I have recently done something that I deeply regret,' and 'Lately, I have felt good about myself and what I have done'); and moral standards defined as subscription to a code of moral principles without reference either to specific behaviours or overly specific beliefs (e.g., 'I believe in a strict interpretation of right and wrong,' 'What is right and wrong depends on the situation,' 'I have always believed strongly in a firm set of moral-ethical principles.'

The Beck Depression Inventory (Beck et al. 1961). This is a 21-item inventory designed to assess depressive symptoms over the past week, including the day of responding. Subjects respond on a four point scale ranging from 0 (not depressive) to 3 (highly depressive). Subjects can circle more than one response.

The Beck Anxiety Inventory (Beck et al. 1988). See p 62 .

Padua Inventory - Revised: (P I-R; Sanavio, 1988; van Oppen, 1995a). This is a 41-item list of common obsessional thoughts and compulsive behaviours (see appendix 1). It was revised from an earlier 60-item list. Each of the 41 items is rated on a five-point scale in terms of the frequency with which they are experienced. The scale points are labelled from `not at all' (score of zero) to `very much' (score of four). All items are negatively phrased (`I feel my hands are dirty when I touch money').

Maudsley Obsessional Compulsive Inventory: (MOCI; Hodgson and Rachman, 1977. This is a 30-item questionnaire. Subjects are requested to respond `TRUE' or `FALSE' to each item. There are four subscales: checking, washing, doubting and slowness.

Statistical Analyses

Following the example of Reynolds and Salkovsksis (1991), correlations were calculated using Pearson product moment correlations. Stepwise multiple regression analyses were used with the total MOCI and PI-R scores as the dependent variables. Regressions were carried out in two separate ways:-

(i) Forcing the same variables used by Niler and Beck into the regression in the same order as they used; ie sex, G-trait, BDI and BAI.

(ii) Allowing all variables for which sufficient data were available to enter in free competition according to their relative significance, to look for the best overall predictors.

4.6.5. Results

Prediction 1a

The means and standard deviations for the main measures used are shown in Table 4.1. The mean scores on the subscales of the GI were compared with published norms using t-tests for independent groups. The results are shown in Table 4.2 and indicate that the present obsessional sample had significantly higher scores than the normal sample of Kugler and Jones (1992) on state guilt, trait guilt, and significan .tly lower moral standards.

Table 4.1. Means and standard deviations of questionnaire measures.

	Mean (sd)
MOCI total	16.63 (4.24)
PI-R total	69.75 (26.76)
BDI total	21.65 (11.52)
BAI total	20.71 (11.57)
Trait Guilt	70.41 (11.75)
State Guilt	34.42 (7.11)
Moral Standards	46.56 (5.37)
Total GI-score	150.71 (17.96)

Table 4.2. Comparison of scores on the GI between obsessional and published norms.

	Obsessionals (n=108)	Normal Adults (n=209) (Kugler and Jones, 1992)	t	p
Trait Guilt	70.41 (11.75)	53.73 (12.54)	7.9	<0.01
State Guilt	34.42 (7.11)	24.44 (6.61)	12.4	<0.01
Moral Standards	46.56 (5.37)	50.15 (8.14)	-4.12	<0.01

Prediction 1b

Correlations

The correlations amongst the measures used in the present investigation which corresponded with those reported in Reynolds and Salkovskis (1991) and Niler and Beck (1989) were calculated. Anxiety was significantly correlated with depression ($r=0.59$, $p<0.001$); trait guilt and state guilt were both significantly correlated with depression ($r=0.52$ and $r=0.56$, $p<0.001$ respectively) and anxiety ($r=0.39$, $r=0.50$, $p<0.001$

respectively). Moral standards were not significantly correlated with depression or anxiety scores ($r=-0.104$, $r=-0.04$ respectively, $p>0.05$).

The correlations between the guilt subscales and measures of obsessionality (including subscales) are given in Table 4.3.

Table 4.3. Product-moment Correlations between Guilt and Obsessionality.

n=108	Trait Guilt	State Guilt	Moral Standards
MOCI total	0.49 **	0.40 **	0.12
MOCI checking	0.40 **	0.34 **	0.09
MOCI washing	0.28 **	0.25 *	0.06
MOCI slowness	-0.04	0.05	-0.04
MOCI doubting	0.34 **	0.22 *	0.07
PI-R total	0.59 **	0.49 **	0.12
PI-R impulses	0.47 **	0.39 **	0.11
PI-R washing	0.23 *	0.14	-0.01
PI-R checking	0.26 **	0.15	0.13
PI-R rumination	0.54 **	0.48 **	0.13
PI-R precision/order	0.26 **	0.27	-.002

** $p<0.01$ * $p<0.05$

Prediction 2

The correlational analyses were repeated controlling for the effects of anxiety and depression, given the strong association between these measures and guilt. The results are shown in Table 4.4.

Controlling for the effects of depression and anxiety revealed a significant positive correlation between total scores on the MOCI and PI-R and Moral Standards scores. Furthermore, many of the associations between the MOCI and PI-R subscales and state guilt decreased and were no longer significant; the majority of correlations between the MOCI and PI-R subscales and trait guilt measure remained strong and significant.

Table 4.4 . Product-moment Correlations between measures of Guilt and Obsessionality, controlling for the effects of depression and anxiety.

n=108	Trait Guilt	State Guilt	Moral Standards
MOCI total	0.43 **	0.29*	0.26*
MOCI checking	0.36 **	0.19	0.17
MOCI washing	0.33 **	0.17	0.22
MOCI slowness	-0.16	0.19	0.12
MOCI doubting	0.21	0.12	-0.02
PI-R total	0.45**	0.26*	0.25*
PI-R impulses	0.26*	0.11	0.18
PI-R washing	0.18	0.05	0.16
PI-R checking	0.30 **	0.17	0.13
PI-R rumination	0.49 **	0.35	0.31
PI-R precision/order	0.12 **	0.11	0.05

** $p<0.01$ * $p<0.05$

Prediction 3

The regression analyses were conducted twice, as Reynolds and Salkovksis (1991) had obtained different results depending on whether the regression analyses were forced in the same order as those found to be significant by Niler and Beck (1989) or whether the variables were allowed to enter into a free sequence.

Stepwise Multiple Regression Analyses

Niler and Beck's sequence. The analyses were carried out firstly using the following as the dependent variables (not unpleasant thoughts as in the previous studies of Niler and Beck, Reynolds and Salkovsksis):-

MOCI total (Table 4.5)

MOCI subscales

PI-R total (Table 4.6)

PI-R subscales.

The BAI was used instead of the Spielberger trait anxiety measure, and trait guilt measured by the GI was entered as the equivalent of trait guilt assessed using the PGI. When the analysis is carried out according to Niler and Beck's procedure (sex, trait guilt, BDI and BAI were the independent variables), the best and only significant predictor of MOCI total was trait guilt. Results are shown in Table 4.5. To comply with Bonferroni's correction for multiple comparisons, the alpha level was set at 0.01.

Table 4.5. Table for analysis forcing sex, trait guilt, anxiety and depression into the equation for MOCI total.

	Multiple R	R^2	Change in R^2	F ratio at entry	Std reg. coeff	F ratio at final	r
Sex	0.18	0.03	0.03	3.17	0.12	1.30	0.19
Trait Guilt	0.50	0.25	0.22	14.84	0.32	9.76	0.49
BDI	0.56	0.31	0.06	13.19	0.18	2.69	0.45
BAI	0.59	0.34	0.03	11.17	0.20	3.84	0.41

The regression analyses were repeated using the subscales of the MOCI, again forcing the same variables as Niler and Beck as the independent variables. Trait guilt was the only significant predictor of MOCI checking and doubting (Multiple R=0.413, F-change(2,88)=8.64; Multiple R= 0.346, F(4,98)=7.2, respectively; $p<0.01$); BDI score was the only significant predictor of MOCI washing (Multiple R=0.29, F(4,91)=8.64). No variables were significant predictors of MOCI slowness.

The regression analysis was repeated using PI-R total as the dependent variable and again trait guilt was the only significant predictor of PI-R total ($p<0.01$) (See Table 4.6).

Table 4.6. Table for analysis forcing sex, trait guilt, anxiety and depression into the equation for PI-R total.

	Multiple R	R^2	Change in R^2	F ratio at entry	Std reg.coef f	F ratio at final	r
Sex	0.06	0.04	0.04	0.365	-0.04	0.25	0.06
Trait Guilt	0.59	0.39	0.34	24.88	0.44	20.43	0.59
BDI	0.64	0.41	0.06	21.20	0.26	5.86	0.52
BAI	0.64	0.41	0.003	15.89	0.06	0.39	0.38

The regression analyses were repeated using the subscales of the PI-R, again forcing the same variables as Niler and Beck as the independent variables and setting alpha=0.01. Trait guilt was the only significant predictor of PI-R factor 1 (impulses) and 4 (rumination) (Multiple R-0.47, $F(4,92)=6.25$; Multiple $R=0.54$, $F(4,99)=15.44$ respectively); BDI score was the only significant predictor of PI-R factor 2 (contamination) (Multiple $R=0.33$, $F(4,96)=10.35$). No variables were significant predictors of PI-R factors 3 or 5 (checking and precision/order).

Free Sequence

The stepwise regression analyses were repeated allowing all variables to enter in free competition according to their relative significance. State guilt and moral standards were entered into the competition. The SPSS for Windows programme selects variables for entry in order of the greatest amount of variance accounted for. The tables show the order in which the variables were entered with 1) MOCI total and 2) PI-R total as dependent variables.

Table 4.7. MOCI total as the dependent variable: free sequence

variables in the equation	Multiple R	RSQ	Change in RSQ	F ratio at entry	Std reg.coef f	F ratio at final	r
Trait Guilt	0.51	0.26	0.26	29.92	0.51	29.92	0.59
BDI	0.56	0.31	0.06	13.19	0.18	2.69	0.45

The regression analyses were repeated using the subscales of the MOCI, again the sequence was free and state guilt and moral standards were allowed to compete. Trait guilt was the only significant predictor of MOCI checking and doubting (Multiple R=0.445, F(1,89)=22.01 Multiple R==0.350, F(1,95)=13.23, respectively; $p<0.01$); BDI score was the only significant predictor of MOCI washing (Multiple R=0.35, F(1,89)=12.56).

No variables were significant predictors of MOCI slowness.

Table 4.8. PI-R total as the dependent variable: free sequence

variables in the equation	Multiple R	RSQ	Change in RSQ	F ratio at entry	Std reg.coef f	F ratio at final	r
Trait Guilt	0.59	0.34	0.34	46.68	0.44	21.16	0.59
BDI	0.64	0.40	0.06	29.81	0.28	8.83	0.52

The regression analyses were repeated using the subscales of the PI-R; again the sequence was free, state guilt and moral standards were allowed to compete, and alpha was set at 0.01. BAI and trait guilt significantly predicted PI-R factor 1 (impulses) and factor 4 (rumination). (**Impulses**: BAI - Multiple R=0.48, F(1,90)=26.92; Trait Guilt - Multiple R=0.55, F(2,89)=19.49. **Rumination:** Trait guilt - Multiple R=0.54, F(1,96)=39.67; BAI - Multiple R=0.61, F(2,95)=28.47); Trait guilt was a significant predictor of PI-R factor 3 (checking) (Multiple R=0.28, F(1,90)=7.42, $p<0.01$). BDI score was the only significant predictor of PI-R factor 2 (contamination) (Multiple R=0.38, F(2,92)=8.12). BAI score was the only significant predictor of PI-R factor 5 (precision/order) (Multiple R=0.32, F(1,90)=10.52).

Prediction 4

Obsessionals scoring in the top quartile of the MOCI checking subscale were labelled `checkers' and their guilt scores were compared with those who scored in the top quartile of the doubting subscale and cleaning subscale. A repeated measures ANOVA was carried out and no significant differences were found between subgroups on any of the guilt

subscales ($p > 0.05$). The results are shown in Table 4.9.

Table 4.9. Comparison among checkers', `doubters' and `washers' on the Guilt Inventory

	Checkers	Doubters	Washers
Trait guilt	75.0 (10.4)	73.6 (10.7)	75.8 (10.1)
State guilt	37.3 (6.3)	36.3 (6.6)	37.7 (6.6)
Moral standards	47.5 (10.4)	47.3 (4.5)	46.8 (6.8)

Summary of Results

Trait guilt significantly predicted MOCI total, checking and doubting regardless of whether the sequence was forced or free. Trait guilt also significantly predicted the PI-R total, the impulses subscale and rumination, in both types of sequence. The BDI predicted MOCI washing and PI-R contamination regardless of the type of sequence; in the free sequence it significantly predicted the MOCI and PI-R total scores. Although the BAI did not significantly predict any variables in the forced sequence, in the free sequence it significantly predicted the PI-R subscales of impulses, rumination and precision/order.

Prediction 1a: An obsessional population will have more guilt (and higher moral standards) than a non-obsessional population. This prediction was partially fulfilled. Obsessionals had higher trait and state guilt than published norms, although they did not have higher moral standards.

Prediction 1b Measures of guilt will be correlated with measures of obsessionality. This prediction was fulfilled.

Hypothesis 1- Guilt is associated with obsessionality - is supported with respect to trait guilt and state guilt, but not with respect to moral standards.

Prediction 2. The correlations between guilt and obsessionality will be reduced by controlling for the effects of depression and anxiety. This prediction was fulfilled and Hypothesis 2 - The relationship between guilt and obsessionality is affected by depression and anxiety - is supported.

Prediction 3: In regression analyses, guilt, depression and anxiety will predict scores on measures of obsessionality. This prediction was fulfilled and Hypothesis 3 - Guilt, depression and anxiety are significant predictors of obsessionality - is supported.

*Prediction 4: `Checkers' and `doubters' will score significantly more highly than `cleaners' on the measure of guilt.* This prediction was not fulfilled and Hypothesis 4 - `Checkers' and `doubters' show more guilt than `cleaners' - is not supported. However, trait guilt was the best predictor of the MOCI subscales of checking and doubting, and not washing.

4.6.6. Discussion

The results provide empirical support for the clinical observation that state and trait guilt are associated with obsessionality. Obsessionals had significantly higher state and trait guilt scores than published norms. However, contrary to the prediction derived from the cognitive-behavioural model, obsessionals did not have higher moral standards.

The finding that obsessionals did not have higher moral standards than published norms, yet felt more guilt, can be interpreted in a number of ways. Firstly, it is possible that the measurement of moral standards is not valid. Partial support for this comes from the lack of variance within the measure. Indeed, it is difficult to imagine someone strongly disagreeing with the statement 'I believe in a strict interpretation of right and wrong' and only 6 subjects (5.6%) reported that they disagreed or strongly disagreed with that statement. However, there was more variability amongst the other items. It is possible that, rather than having higher moral standards per se, obsessionals perceive themselves to have transgressed those standards more frequently (or more intensely) than others. Therefore, a cognitive intrusion in an obsessional person may be interpreted in terms of violating a moral standard, giving rise to feelings of guilt; the same intrusion may not be seen to violate the same moral standard in a non-obsessional. This suggestion is in keeping with the emphasis of the cognitive-behavioural model that interpretation of intrusions is important in obsessionals and could be tested empirically.

The results showed a strong association between trait guilt and obsessionality that was maintained when the effects of depression and anxiety were partialled out. The association between state guilt and obsessionality was reduced once the effects of depression and anxiety were considered, suggesting that current feelings of guilt are mediated somewhat by affect. The relationship between moral standards and obsessionality was particularly interesting. It would appear that the association between high moral standards and obsessionality is masked when depression and anxiety are considered. This could occur in the following way: subjects who are depressed may believe

themselves to be worthless and even, perhaps, evil. Therefore, they would not consider their own moral standards to be particularly high. However, if the effect of depression or anxiety is removed, an association between high moral standards and obsessionality becomes evident. This suggested relationship is in keeping with the cognitive-behavioural model and may explain how thoughts are imbued with an appraisal in terms of guilt (and responsibility).

The regression analyses were conducted twice, as Reynolds and Salkovksis (1991) had obtained different results depending on whether the regression analyses were forced in the same order as those found to be significant by Niler and Beck (1989) or whether the variables were allowed to enter into a free sequence. In both sets of analyses, trait guilt significantly predicted total obsessionality and contributed to the prediction of several subscales, notably doubting/rumination. Trait guilt also significantly predicted the score on the checking subscale of the MOCI. Although the measurse of the dependent variables (MOCI and PI-R) were different from those used by either Niler and Beck or Reynolds and Salkovskis, all studies were designed to determine whether guilt was a strong predictor of variables associated with obsessionality. Of note, state guilt and moral standards did not contribute significantly to the total scores of obsessionality or to any of the subscales.

It is important to note that depression scores contributed significantly to the prediction of washing/contamination subscales. It would seem, therefore, that depression, not guilt, contributes to this one form of obsessionality. However, guilt contributes to rumination, checking and the overall score of obsessionality. Given that the majority of people with OCD experience depression and that guilt is a major part of depression, it is possible that people with checking behaviour develop washing behaviour after an episode

of depression. Similarly, it is possible that people who have washing behaviour, in particular, are more likely to have checking and rumination problems if guilt forms a major part of their depression. These suggested relationships should be explored further; they give rise to predictions that are easily testable within an experimental design.

Given the findings from the regression analyses, it is not surprising that the hypothesis that checkers and doubters would show more guilt than `washers' was not fulfilled. Since guilt forms a major part of depression, and regression analyses indicate that depression contributes significantly to the prediction of washing behaviour, the total amount of guilt experienced by all subgroups may be similar. It is suggested that it is not the amount of guilt per se that is important, but rather whether the guilt is depressive or obsessional in nature.

Suggested differences between `obsessional' and `depressive' guilt are purely speculative. However, Berrios et al. (1992) have suggested that depressive guilt comprises a cognitive/attitudinal factor (e.g. being ashamed of something done, feeling as if you have committed a sin, feeling you must die to pay for your sins, and feeling like praying to God for forgiveness) and a mood/feeling factor (e.g. feeling wicked for no reason, feeling guilty for no reason, and feeling people know that you are a bad person). On the other hand, obsessional guilt is hypothesised to be associated with responsibility (Rachman, 1993).

The relationship between guilt and responsibility is complex. Micelli (1991) has suggested that in order to have guilt, it is necessary (a) to assume responsibility for the event, and b) to judge that event to be harmful. Unreasonable guilt could stem from

either unreasonably assuming responsibility (it is unreasonable to feel responsible for a misfortune to which one does not contribute or over which one has no control) or from exaggerating the harm of the event. For example, `obsessional' guilt could be experienced by a person in a restaurant whose friend was rude to the waiter. Logically, one should not feel guilty as one had little or no contribution to the act. The person may misjudge the harmfulness of the consequence and imagine that the waiter is perhaps distressed. Another example of `obsessional guilt' is the guilt experienced when a person borrows his/her boss's car and gets rear-ended. Logically, the person should not experience guilt as he/she could not have foreseen the event, and had no control and therefore, according to logic, did not have any responsibility. However , the person may experience `obsessional' guilt if he/she perceive falsely that they had control or else if they mistook hindsight for foresight.. There is evidence that inflated responsibility is a feature of OCD (e.g. Rachman, 1993; see chapter 5) and that risk appraisals are biased in obsessionals (Carr, 1974).

The types of guilt which are thought to characterise obsessionality and depression respectively overlap considerably, particularly in the area of cognitions/attitude. The above account speculates that guilt is a common link between obsessions and depression, but it is well noted that having a disorder such as OCD is depressing (Rachman and Hodgson, 1980; pp. 35-36.). If having OCD led to depression, it is suggested that both forms of guilt should be present. If a person has multiple obsessions, including washing, then both forms of guilt should be present according to this account. However, if a person has only depression, or only checking/rumination difficulties, only one type of guilt is hypothesised to be present. A series of clinical studies might perhaps be designed to test

this proposed account of guilt in OCD and depression.

Although the theoretical relationship between guilt, depression, morality and responsibility is beyond the scope of this thesis, consideration of these issues has proved to be particularly interesting and challenging throughout the duration of the research.

4.7. Summary

Guilt is one of the features of the OCD considered to be important in the cognitive-behavioural account of the disorder. Clinically, people with OCD are often plagued with guilt. However, research into this area has produced conflicting results. Therefore a large study to examine the nature of guilt in an obsessional population was undertaken. The results indicate that trait guilt is strongly associated with obsessionality, independently of the effect of depression and anxiety. Associations between state guilt and obsessionality may be mediated by depression and anxiety. Obsessionals did not have higher moral standards than published norms. Trait guilt was the best predictor of obsessionality overall, but depression was the best predictor of washing behaviour and contamination fears. It was suggested that there may be two types of guilt - obsessional guilt and depressive guilt - which are different but related. Contrary to predictions, there were no differences on guilt subscales among checkers, doubters and cleaners.

4.8. Religion and Guilt

Guilt is an implicit and explicit part of many religions, although the association between religiosity and guilt has rarely been explored in a systematic manner (Narramore, 1974). In a psychometric study of normal subjects, religiosity was a significant predictor

of guilt (Demaria and Kassinove, 1986). Although the study described below did not specifically investigate the relationship between guilt and religion, the two are related, yet can be considered separately within the cognitive-behavioural model of OCD.

4.9. Religion and the cognitive-behavioural model of OCD

The cognitive-behavioural model of OCD suggests that intrusive thoughts may activate dysfunctional schemata and result in unpleasant automatic thoughts relating to ideas of being responsible for negative outcomes (Salkovskis, 1985). Dysfunctional beliefs are thought to be encased in schemata which have a variety of properties: content, valence, permeability, density and flexibility (Beck, 1991). These dysfunctional beliefs encased in the schemata may be formed in a variety of ways, including learning experiences. It is stated that 'At this stage, we can only speculate about the possible causes of the process by which obsessions acquire extraordinary significance for the person. The inclination to over-interpret the significance of our intrusive thoughts can be taught by direct instruction, moral or religious. Moral education may also promote elevated levels of personal responsibility' (Rachman, 1993; emphasis added).

A strict religious upbringing may give rise to the belief similar to 'sin by thought, sin by deed', as in the quote of FC which opened this chapter. Other beliefs may be 'I will be punished if I have bad thoughts' or 'I will be sent to Hell if I have bad thoughts' or 'Only bad people have bad thoughts' or 'If I think something, I must want it to happen and therefore I am bad etc'. If a person were to hold dysfunctional schemata encasing beliefs such as these, a normal unwanted intrusive thought (for example, I wish my brother were dead) would, according to this model, interact with the dysfunctional schemata and result in a negative automatic thought such as 'I have sinned by having that thought', 'If my brother dies, it will

be my fault', 'I will go to Hell for thinking that thought', 'My brother will die as a punishment for my wicked thoughts', etc. One of the subjects who participated in research for this thesis stated 'I also have the thought that something awful (death mostly) will befall my husband and son if I do something I consider wrong' (CM).

In summary, according to the model, a religious upbringing instils a set of beliefs and moral values that are likely to be activated on the occurrence of a normal unwanted intrusive thought. In turn, negative automatic thoughts result relating to ideas of being responsible for harm coming to oneself or others, perhaps in the form of divine punishment.

4.10. The Clinical Picture of Religious Obsessions

Religious obsessions were recorded in the earliest documentation of obsessional phenomena. One of the earliest descriptions stems from the 15th Century compendium on psychopathology and witchcraft, *Malleus Maleficarum*. This records that 'a certain Bohemian..brought his only son, a secular priest, to Rome to be delivered because he was possessed...When he passed any church, and genuflected in honour of the Glorious Virgin, the devil made him thrust his tongue far out this mouth..when [he] tr[ied] to engage in prayer, [the devil] attack[ed him] more violently' (Kramer and Sprenger, 1951). Today, the themes of an obsessional problem can be remarkably similar, as illustrated by one of the subjects in the current study: *'Since 19 years of age I have thought about the word 'Devil'. I do not hear voices, nor do I believe I am the devil or anyone else is the devil. Associated with this word, I also get or experience a range of negative automatic thoughts. Associated with such thoughts are feelings of anxiety and depression' (IB).*

The theme of the devil is only one type of obsession related to religion. Another theme related to religion is that of 'scrupulosity'. This term is derived from the Latin

'scrupus', whose diminutive form, 'scrupulus' means a small sharp stone. Conceptually, a minute weight could tip the scales of a sensitive balance, such as the scales of conscience (Palazzioi, 1962). Early descriptions of scruples preceded the psychiatric definition of obsessions by two hundred years. In the 17th century, scrupulosity was considered to include both religious overconcern and a general indecisiveness (Hunter and MacAlpine, 1963). 'Scrupulosity' is often incorrectly used interchangeably with the term 'religious obsessions' (for example on the Yale Brown Obsessive Compulsive Scale; Goodman et. al., 1989a). In fact, scrupulosity refers to an excess concern with the moral code of the religion, and difficulty in deciding between what is right and what is wrong. Scrupulosity can therefore be differentiated from concerns about blasphemy and being sacrilegious.

Janet (1903) first classified scrupulosity as a psychiatric rather than a religious state, placing it in his overinclusive category of psychasthenia. Today, scrupulosity is 'diagnosed' when there is excessive observance of religious or moral teachings to a degree that a) far exceeds the expected practice of the individual's moral or religious reference group and b) is very difficult to actually accomplish, thus becoming a source of great distress to the person and the person's social network (Greenberg, 1984). A good example of the sort of scrupulosity that is found in an obsessional population is provided by the concern of one of the cases seen in the study (DL). DL was plagued by whether he had been immoral by 'stealing' some paper towels from the office where he worked as a volunteer. His primary concern was that he had done something 'wrong', was a bad person and therefore would be punished by God for his sins.

Other types of religious obsessions include Blasphemous concerns which usually occur in people for whom religion is important. For example, James (1942) observed that 'the lives of the saints are full of such blasphemous obsessions, ascribed invariably to the direct

agency of Satan' (p.167). Blasphemous obsessions include the fear of blurting out 'God does not exist' in Church for example, or thinking the thought that God does not exist. Compulsive behaviours may include covert neutralising as in one of the cases in the study (CM?). Whenever she had the intrusive thought that 'God does not exist' she would feel compelled to think and image the sentence that 'God DOES exist' clearly, three times. Similar to people with scrupulosity, she feared that she would be punished for doubting the existence of God (even though she did not rationally doubt His existence) and would therefore go to Hell for eternity. Intrusive blasphemous images are also described by patients who, for example, may experience the image of having a sexual relationship with Jesus. This causes a considerable amount of distress and concern, often regardless of the degree of religious observance practised by the patient. Religious images may also be used as a means of neutralising the responsibility appraisal of the intrusive thoughts, for example 'The thought is that something awful is going to happen, not to me, but to my family...what I do now when I get this thought is to imagine certain things. It is a very fixed sequence. I have to visualize pictures of my wife, my parents - who are both dead now - then pictures of the Virgin Mary and Jesus Christ...When I imagine pictures of the Virgin Mary and Jesus Christ, they have to have little golden-yellow lights around them' (de Silva and Rachman, 1992, p. 37). Another example is provided by one of the subjects who participated in research for this thesis. 'I find myself unable to relax or concentrate for very long without having really bad thoughts come into my mind. When they come I feel a compulsion to pray to God for forgiveness and once I start praying ...if I feel that I haven't done it correctly, I have to start all over again' (P.L).

4.11. A literature review of religion and OCD

Freud (1907) was perhaps amongst the first to comment on the parallels between

religious ceremony and obsessional rituals (C. Lewis, 1994). Freud considered religion and obsessions to have the same function, namely that of controlling instincts and impulses, reducing anxiety associated with apparent moral transgressions and warding off potential disasters. Aubrey Lewis (1936) was 'impressed by the frequency with which filth, harm, sex or religion give the content to the obsessional idea' (p.326, emphasis added). In more systematic investigations, it has been found that between 5% and 16% of obsessions have a religious theme (Dowson, 1977; Akhtar et al., 1975; Rachman and Hodgson, 1980; Steketee et al., 1991). In Egypt, a recent study found that 60% of their obsessional sample had religious obsessions (Okasha et al., 1994).

Superficially, compulsions appear to closely resemble religious rituals, for example in the Jewish religion, after prayer, hands should be washed in a specified particular manner before eating. Fear of contamination is echoed in the dietary laws' avoidance of non-kosher food and separation of milk and meat. Jewish law dictates that all rituals should be performed precisely and correctly, concerns which are manifest in the performance of obsessional rituals. Greenberg (1984) suggested that religious rituals and compulsions could be differentiated on the basis that:-

- religious rites are not resisted.
- religious rites are not ego-dystonic.
- religious rites do not interfere with social, work or role functioning.
- religious obsessions are restricted to particular topics and do not reflect excessive concern in all areas of religious practice.

By contrast, obsessions are:-

- personal
- recognised to be irrational, at least in part

- distressing
- resisted
- repugnant
- unwanted

In his analysis, Greenberg suggested that it was the individual's personality that was a determining factor in becoming religious and that certain religious rituals were 'particularly suitable for the development of obsessive fears' (p.530). In his study, half of the obsessional patients at a psychiatric clinic in an orthodox area of Jerusalem reported experiencing obsessional problems relating to their religion at some time in their lives. The onset of their obsessional difficulties was often related to an increase in religious commitment. One of the important distinctions drawn by Greenberg and echoed in a phenomenological analysis of two cases, is that obsessional symptoms often exaggerate a particular part of a religious ritual at the expense of other areas of religious practice (Hoffnung et al., 1989). One of Greenberg's religious patients was successfully treated with exposure and response prevention, whilst ensuring that the religious laws were not contravened (Greenberg, 1987). General difficulties with treating religious patients have been noted elsewhere (Greenberg, 1991).

A review of the literature concluded that the evidence for religious factors in the aetiology of OCD was ambiguous and that methodology must be improved before any firm findings can be drawn (Fitz, 1990). The need for the multidimensional nature of religion to be considered was emphasized. A review of the same literature led to the conclusion that religion was a medium that 'partly determines <u>how</u>, although not necessary <u>whether</u>, [obsessional] symptoms are expressed' (Steketee et al., 1991, p.360; original emphasis). These authors conducted a good methodological investigation of religion, guilt and

obsessionality, and a relationship was found between the degree of religiosity (a self-report measure on a 4 point scale) and OCD symptoms (Steketee et al. 1991). 'Religiosity' can be defined as `the degree to which a person believes in and practices his or her religion' (Demaria and Kassinove, 1988). A relationship was found between religiosity and guilt, but contrary to expectations, OCD patients were not more religious than patients with other anxiety disorders. This study did not find particular religious faiths such as Catholicism and Judaism to be more associated with obsessionality than other religions, although these religions are often selected for special consideration (Suess and Halpern, 1989).

During the course of this thesis, a study was reported comparing religious factors in patients with OCD (n=86), panic disorder (n=73) and non-anxiety psychiatric disorders (n=292) (Higgins, Pollard and Merkel, 1992). Four religious factors were assessed by questionnaire (the rating of which is not described). These factors were the patients' religion of origin, whether they perceived their parents as religious, whether they were currently involved in organized religious activities, and whether they were currently experiencing religious conflict or doubt. Of these factors, the results indicated that only the 'religious conflict' factor was more closely associated with OCD than with other psychiatric conditions. The authors did not consider their findings within the cognitive-behavioural model of OCD, but it is possible that the conflict was between the types of intrusive thoughts experienced by the patients, and the patients' religious and moral beliefs concerning the morality of having blasphemous, sexual and violent cognitions. The authors concluded that 'A better understanding of the complex relationship between obsessions, compulsions, and a variety of factors related to religious background, practice and beliefs will not be gained without a great deal more research' (p.84).

Recently, an association was found between religiosity (as measured by the 'Francis

Scale of Attitudes Toward Christianity'; Francis and Stubbs, 1987) and obsessional traits, but not between religiosity and obsessional symptoms (as measured by the Sandler-Hazari Obsessionality Inventory; Sander and Hazari, 1960) (Lewis, 1994). This study was conducted on a student sample, and it was suggested that 'a more accurate examination of this issue may be through the use of a sample for whom religion has some special salience', such as the 'obsessional neurotic' (p. 192, Lewis, 1994).

Scrupulosity and other religious obsessions are amenable to the same treatment methods as other obsessional complaints. Behaviour therapy, fluoextine and clomipramine are all effective treatments of the disorder (Greenberg, 1987; Fallon et al., 1990; Suess and Halpern, 1989). However, special considerations are needed when undertaking behaviour therapy with religious patients (Greenberg and Witzum, 1991).

4.12. A study of religion, morality and obsessionality

4.12.1 Background

Religious obsessions concerning blasphemy and scrupulosity may occur in approximately 10% of patients (Rachman and Hodgson, 1980; Fallon et al., 1990). Despite the well documented clinical phenomenon, little systematic research has been conducted examining the nature of religious beliefs and how they relate to morality, guilt and obsessional behaviour. One study investigating religion in OCD patients measured `religiosity' by asking subjects : how religious they considered themselves to be on a four point scale and no psychometric data were available (Steketee et al. 1991). A second study on OCD patients identified 'religious conflict' to be associated with obsessional symptoms (Higgins et al., 1992) but no data were obtained to specify the nature of such a conflict.

As in eating disorders, a number of relationships might be proposed linking religion

and OCD, some of which are contradictory (Joughin et al., 1992). It may be that the clear moral guidelines of the religion help protect against the development of a disorder in which the assuming of responsibility and control is so central. Alternatively, it may be that an inability to adhere to strict guidelines that are easily transgressed leads to feelings of guilt and depression. This may lower resistance to normal intrusions which then become difficult to dismiss, more aversive and so on. Perhaps the most simple relationship would be that religious beliefs such as 'sin by thought, sin by deed' are encased in dysfunctional schemata and interact with normal intrusive thoughts resulting in an appraisal in terms of responsibility (Salkovskis, 1985). However, little systematic data have been collected on the relationship between the extent of religiousness, moral values and obsessional symptoms. The present study was intended to address some of these issues in an examination of the possible relationship between obsessional symptoms and religion.

4.12.2. Aims

The aim of the present study was to determine the perceived relationship between religious beliefs, morality and obsessional variables.

4.12.3. Hypotheses and Predictions

Hypothesis 1

Religious people are more obsessional than non-religious people.

Prediction 1

Subjects who report religious faith/beliefs will have higher scores on measures of obsessionality than subjects who do not report religious faith/belief.

Hypothesis 2

Religious variables are associated with clinical variables

Prediction 2

Within the group who report having a religion, religious variables will be correlated with measures of obsessionality.

4.12.4. Method

Subjects

Subjects were recruited in the same manner described in earlier studies. Approximately 200 sets of questionnaires were sent out. 118 usable replies (59%) were received (i.e. the majority of all three questionnaires were completed). The mean age of the sample was 36.03 years (sd=11.16; age range 17-70). 82.2% of the sample were female (n=97).

Measures

Religion and Obsessions Questionnaire (ROQ). This questionnaire was based on that of (Joughlin et al., 1992) designed to assess the perceived relationship between eating disorders and religion. The questionnaire asks patients their religion and the religion of their parents. A visual analogue scale (0 to 100) is used to assess the importance of religious beliefs, the strength of religious beliefs as a child, the importance of religion to the subject's parents, the impact of obsessions/compulsions on religious beliefs, whether the subject's religion offers a clear set of moral guidelines and whether obsessional

difficulties have conflicted with the subject's religious code.

Padua Inventory - Revised: (PI-R; Sanavio, 1988; van Oppen, 1995a). See above.

Maudsley Obsessional Compulsive Inventory: (MOCI; Hodgson and Rachman, 1977).

See above.

4.12.5. Results

The mean MOCI total score of the sample was 16.90 (sd=4.56); the mean PI-R total was 70.88 (11.16). Sixty eight percent of the sample said that they had a religion (n=80), 32% (n=38) said that they did not. Of those who reported a religion, 56.3% (n=49) were Anglican, 17.5% (n=14) Roman Catholic, 18.8% (n=15) belonged to other religions (eg Jehovah's Witness, Buddhist, and Greek Orthodox), and 6 subjects did not specify a particular affiliation. Within the entire sample, subjects reported 60% of their fathers and 73% of their mothers, as having religions.

For most of the analyses, the sample has been divided into those who said they had no religion (n=38) and those who said that they had a religion (n=80). There were too few subjects in religions other than Anglican to warrant analyses according to the type of religion specified.

Prediction 1

Independent t-tests were conducted to compare clinical variables between subjects who said they had no religion with subjects who said they had a religion (Table 4.10). Subjects who reported having a religion scored significantly more highly on the MOCI subscale of doubting ($t = 2.07$, $p < 0.05$) and the Padua subscale of rumination, ($t = 2.12$,

$p<0.05$). The data were further analysed to examine whether there were differences in MOCI or Padua data between those subjects reporting their parents as having a religion and those who did not. No significant differences were found on any of the clinical variables ($p>0.05$).

Table 4.10. Clinical variables for those with a religion and those with no religion.

Questionnaire Score	No Religion (n=38) mean (sd)	Religion (n=80) mean (sd)
MOCI wash	4.0 (3.2)	4.3 (3.0)
MOCI checking	6.2 (1.5)	6.1 (1.9)
MOCI slowness	2.9 (1.7)	2.8 (1.6)
MOCI doubting	4.9 (1.4)	5.39 (1.2)*
PADUA impulses	6.3 (6.7)	6.8 (6.1)
PADUA contamination	14.6 (12.3)	15.8 (12.9)
PADUA checking	16.2 (8.2)	15.3 (7.8)
PADUA rumination	22.5 (10.9)	26.8 (9.8)*
PADUA precision/order	8.58 (7.14)	9.42 (7.1)
MOCI total	16.58 (5.3)	17.07 (4.2)
PADUA total	65.46 (29.7)	73.48 (27.7)

*$p<0.05$

Prediction 2

As in the study of Joughlin et al. (1992)., the validity of the

weakening/strengthening question from the ROQ (Q2) was examined by correlating this item with a new variable derived by a subtraction of strength of religious belief as a child (Q5) from the present importance of religious belief (Q1). Some validation was shown by a correlation coefficient of 0.39, $p<0.001$. Two other variables were derived by separately subtracting the importance of the parents' religion from that of the subjects': `Relative Importance of Religion Subject/Father' (Q1-Q6) and `Relative Importance of Religion Subject/Mother' (Q1-Q7). A correlation matrix is presented for correlations between clinical and religious variables, including these two derived variables (Table 4.11)

Table 4.11. For Ss who have a religion: Product-moment Correlations between clinical and religious variables

n~80	MOCI				
	wash	check	slowness	doubting	TOTAL
Importance of religion	.06	-.09	-09	-.05	-.01
Effect of OC problems on religion	.13	-.03	.02	-.04	.05
Moral guidelines from religion	.04	-.01	-.16	.07	.03
Conflict of OC problem with moral guidelines	.25*	.18	-.03	.04	.31*
Strength of religion as a child	-.29*	-.16	-.03	.07	-.32**
Importance of father's religious beliefs	-.19	-.03	.05	.06	-.14
Importance of mother's religious beliefs	-.09	.03	.00	.01	-.05
Parent's religion provide moral guidelines for family	-.11	-.08	-.11	-.01	-.17
Strength of religion relative to father	.21	-.05	-.12	-.08	.01
Strength of religion relative to mother	.14	-.09	-.07	-.02	.04

Table 4.12. For Ss who have a religion: Product-moment Correlations between clinical and religious variables

n˜80	PADUA - R					
	Impulses (F1)	Washing (F2)	Checking (F3)	Rumination (F4)	Precision /Order (F5)	TOTAL
Importance of religion	-.02	.07	-. 27*	.04	.09	-.01
Effect of OC problems on religion	.06	.06	-.07	.18	.08	.06
Moral guidelines from religion	.07	.05	-.15	.10	.03	.03
Conflict of OC problem with moral guidelines	.30**	.18	.19	.32**	.27*	.41**
Strength of religion as a child	-.07	-.06	0.08	-.16	-.14	-.05
Importance of father's religious beliefs	-.19	-.13	.12	-.10	-.24	-.16
Importance of mother's religious beliefs	-.03	-.01	-.03	.00	-.15	-.02
Parent's religion provide moral guidelines for family	-.02	-.01	0.03	-0.05	-.30	-.05
Strength of religion relative to father	.12	.17	-.28*	.10	.23	.12
Strength of religion relative to mother	-.01	.08	-.19	.01	.15	.14

*p<0.05, **p<0.01

Results Summary

Prediction 1 was not fulfilled. There were no differences on obsessional variables between subjects with a religion and those without with the exception of doubting/rumination . There was no support for the hypothesis that religious people are generally more obsessional than non-religious people. Prediction 2 was partially fulfilled, in that there was a consistent association between the obsessional variables and the extent to which having obsessional problems conflicted with the moral code of the religion. There was therefore partial support for the hypothesis that religious variables are associated with clinical variables.

4.12.6. Discussion

The results showed a significant positive relationship between the extent to which subjects felt that their obsessive-compulsive problem had conflicted with the moral guidelines and code of conduct of their religion, and the extent of the obsessional problem as measured by the MOCI and the PI-R. Although there were other significant associations between variables, there was no other consistent relationship found between the religious variabls and the obsessional variables when measured by both the MOCI and PI-R. These relationships are therefore not considered robust and will not be discussed further.

The results of this study can be compared to the study investigating religious beliefs in patients with eating disorders (Joughlin et al. 1992). Although the number of subjects is smaller in the current study, subjects in both studies were in the community and self-

selected in choosing to reply to requests for research volunteers. Unlike the study investigating religion in patients with eating disorders, subjects in this sample who had a religion were not, overall, more severely than subjects who had a religion. However, in both studies, the term 'have a religion' may be ambiguous, as many people who describe themselves as 'having a religion' say so because they have parents that were of a particular denomination. They may not have had any religious practices or beliefs themselves, and this is one of the major disadvantages of conducting a self-report questionnaire study as opposed to interviewing participants.

There was also no significant relationship between the importance of religious beliefs and extent of obsessionality, or between the importance of religious beliefs and the effect of having obsessional problems on the subjects' religion. One possible reason for this discrepancy is merely statistical: correlations between the variables are often of a similar magnitude in both samples, but are only statistically significant in the study of subjects with eating disorders owing to the large sample size.

It is interesting that, although there was no association between the extent to which religion offered moral guidance and the extent of obsessionality (or eating disorders), nevertheless in both studies there was an association between the conflict of the problem with the moral guidelines of the religion and the extent of the problem. This finding extends that of Higgins et al. (1992, who found that 'religious conflict' characterised obsessional patients more than other psychiatric patients.

The notable finding of this study is therefore the strong association between obsessionality and the conflict of the obsessional problem with the moral guidelines of the religion. This finding can be considered within the cognitive-behavioural model of OCD

(Salkvoskis, 1985). According to the model, the interpretation of intrusions in such a way that they are accorded special significance in terms of appraisals of responsibility is the key to intrusions becoming aversive, avoided and repetitive (Salkovsksis, 1989). It is only when occurrence and content of the intrusions are appraised as having violated a moral code (regardless of the extent or nature of the moral code) that the intrusions will be appraised in terms of responsibility and acquire obsessional properties. People may interpret the violation of the moral code as evidence that they are blasphemous or evil, and are likely to be punished (in the form of harm befalling loved ones) unless restitution is made. For example, one may have the intrusion that 'God does not exist'; the appraisal may be 'I am a sinner and I will be punished for having that thought unless I say 'God does exist three times'. The same intrusive thought in a person who did not believe that it was a sin to doubt God's existence, would not lead to the same urge for restitution.

The study did not distinguish between thoughts which may conflict with the moral guidelines of the religion, and compulsive behaviours such as checking, which may perhaps conflict with the moral code of the religion. Future studies should try to separate out the precise nature of the conflict and the type of violations perceived.

Rachman and Hodgson (1980) suggested that people with obsessional difficulties were of `tender conscience' (p.252), as described by Jeremy Taylor (1660) and quoted in Hunter and Macalpine, 1963, p.163-164), in that 'They repent when they have not sinned, and accuse themselves without form or matter'. The results suggest that, for someone with an obsessional problem, the degree of objective morality or religion is unimportant; rather it is perception of the violation of morality with the occurrence of intrusive thoughts, that may serve to both precipitate and maintain an obsessional disorder.

The relationship between morality, religion and obsessional problems warrants further research. It would be fruitful to examine the relationship between the religious variables outlined in this study and the type of obsessional intrusions (religious vs non-religious), as opposed to the severity of the problem. It is possible that subjects who experience the greatest the conflict of the obsessional problem with the moral guidelines of the religion are more likely to experience religious obsessions as opposed to other types of obsessions. Future research should, if possible, use interviews as opposed to self-report measures in order to identify the meaning of the religion for individual. The sort of conflict between the moral code of the religion and the obsessional difficulties could be explored further in order to specify both the nature of the conflict and the interpretation of a perceived violation of the moral code for the individual.

4.13. Summary of the relationship between religion and OCD

Religious obsessions can be considered within the framework of the cognitive-behavioural model, as strict religious or moral upbringing may result in dysfunctional schemata which interact with intrusive thoughts to produce an appraisal in terms of personal responsibility. This study has produced the first quantitative analysis of the association between religious and obsessional variables. Obsessional complaints often have a religious theme, as evidenced by clinical descriptions and epidemiological studies. Relatively few empirical investigations have been conducted examining the relationship between obsessionality and religiosity. The results from a questionnaire study are reported. Subjects who reported having a religion did not score more highly overall on measures of obsessionality. However, an association was identified between obsessional

complaints and the conflict of the obsessional problem with the moral guidelines of the religion. Further research investigating this conflict in more depth is suggested.

CHAPTER 5

Perceived responsibility and OCD

'I think that if I don't do my rituals then something terrible will happen and it will be my fault' (AB).

' I think things have got the way they are due to me having my own responsibilities and making sure no harm comes to my children. In my mind, dog mess is dangerous and I am afraid of it, so I have to make sure it does not get near my children' (J.Lo).

5.1. Introduction

In the previous chapters, the cognitive-behavioural model of OCD was described, and a study was reported exploring the type of anxiety that may characterise the disorder. Studies on religion and guilt were also described. The appraisal of intrusive thoughts in terms of responsibility is the crux of the cognitive element of the cognitive-behavioural model. Throughout this chapter and thesis, the term `responsibility' refers to subjective, perceived responsibility as opposed to real, objective responsibility. This chapter briefly reviews the relevant aspects of the cognitive-behavioural model in terms of responsibility appraisals. The relevance of data on responsibility to the 'heterogeneity' hypothesis is commented upon. Evidence relating to the importance of perceived responsibility in OCD is reviewed from clinical observations, psychometric data, studies in which responsibility has been manipulated and treatment. Three studies investigating perceived responsibility and OCD are then reported. The first concerns the use of an instrument to assess responsibility and its

relationship to obsessionality (and guilt) in an obsessional population. The second describes the development of a questionnaire to measure responsibility and relates responsibility to obsessionality (and guilt) in a normal population. The final study reports on a manipulation of responsibility and the effects of the manipulation on obsessional symptoms.

5.2. Responsibility and the Cognitive-Behavioural Model

According to the cognitive part of the cognitive-behavioural model, perceived responsibility is central to OCD (see chapter 2). In the most recent elaboration of the model (Salkovskis (1995), the fundamental difference between the intrusive thoughts that occur normally and those which beseige the OCD patient is still considered to be 'the way in which obsessional patients interpret intrusions as an indication that they may be responsible for harm or its prevention...intrusive thoughts, impulses, images and doubts are normal, but only people who have an enduring tendency to misinterpret their own mental activity as indicating personal 'responsibility' will experience the pattern of discomfort and neutralising characteristic of OCD' (original emphasis, Salkovskis, 1995). It is the misinterpretation of the intrusive thought that is considered to be critical. Once misinterpreted, discomfort ensues and behaviours designed to alleviate the discomfort serve to reinforce the frequency of intrusions: 'The distorted sense of responsibility which the sufferer attaches to his or her activities.. leads them ...a pattern of mental effort characterised by both overcontrol and pre-occupation.' (Salkovskis, 1995). This hypothesis gives rise to a number of propositions, one of which was that 'appraisal of responsibility and consequent neutralising can arise ...from an increase in the level of perceived personal responsibility' (proposition number 6, p. 678, Salkovskis, 1985).

The recent paper includes a definition of the appraisals of 'responsibility' made by

obsessional as 'The belief that one has power which is pivotal to bring about or prevent subjectively crucial negative outcomes' (Salkovskis, Rachman, Ladouceur and Freeston, 1992). Neutralising is re-defined in this paper as 'voluntarily initiated activity which is intended to have the effect of reducing the perceived responsibility'. It also serves to reduce anxiety which may result from reducing the perceived responsibility, but may also be independent of it. Intrusions are considered to be appraised on two dimensions - the occurrence and content - in terms of having implications for responsibility. Appraisal links the intrusive thought with both distress and the occurrence of neutralising behaviour. It is suggested that, if the appraisal solely concerns harm or danger without an element of responsibility, then the effect is more likely to be anxiety or depression as opposed to obsessional problems.

5.3. Responsibility and the Heterogeneity Hypothesis

Although perceived responsibility is a fundamental part of the cognitive-behavioural model, it is not considered to be important by neurological theorists, who consider the disorder to be a 'brain hiccup' (Forster, 1994). In testing the heterogeneity hypothesis outlined in the introduction and specified in chapter 9, it is plausible to suggest that if the disorder is heterogeneous, one sub-group will have difficulties which include excessive perceived responsibility, and the other will not. Data generated in the second study described were used to test the heterogeneity hypothesis, details of which can be found in chapter 9.

5.4. Evidence for the importance of perceived responsibility in OCD

A wide variety of evidence supports the hypothesis that perceived responsibility is associated with OCD. Evidence that will be reviewed includes clinical observation,

psychometric assessments and a study in which responsibility was manipulated.

5.4.1 Clinical evidence for the importance of perceived responsibility in OCD

Although Salkovskis (1985) is often credited with drawing attention to the importance of perceived responsibility in OCD, it is acknowledged that he drew upon documented clinical observations in order to formulate the model. It must also be remembered that evidence used to formulate a model cannot then be cited as support resulting from testing a prediction made by the model. One of the earliest papers noted that checking behaviour occurred most when patients were alone and was 'less intense when responsibility is diminished' (Rachman, 1976b, p. 273-4). The significance of responsibility was discussed in terms of criticism and guilt, but a full cognitive model was not formulated. Case descriptions have been given, exemplifying the theoretical propositions (Salkovskis, 1985). The first case feared that she would be contaminated by substances and that it would all be her fault because she had not done enough to prevent such an occurrence. A second case feared that he was responsible for something that might result in a terrible disgrace. A further two cases have been described in which a single learning experience was suggested to explain obsessions, exaggerated perceived responsibility and guilt (Tallis, 1993).

Some of the subjects who participated in research for this thesis reported ideas of excessive perceived responsibility for negative outcomes. Some examples are given below:-

'As is quite common, I am a checker of cookers, taps, switches etc. I also have a daily household routine of cleaning and checking that I HAVE to do EVERY day. But probably the worst 'thing' is that I have intrusive, unwanted thoughts that I will write 'bad' things, i.e. things that are not true or verging on the truth but extremely

exaggerated, that will cause a lot of trouble, disaster or heartache if read and believed by certain people' (JW, emphasis added).

'I get thoughts in my head that if I don't do these things I'll get spots and also I think something terrible will happen to my daughter and me' (J.Ly).

5.4.2. Psychometric Studies

A questionnaire designed to measure responsibility in a clinical and non-clinical population has been developed by the Oxford Group ('The R-scale'; Salkovskis, Gledhill and Reynolds, 1993). The questionnaire comprises mainly self-referent items (except for two) and aims to assess responsibility for harm. Preliminary findings show that OCD patients perceive themselves to be responsible for negative events significantly more than matched controls. Questionnaire items include 'I often feel responsible for things that go wrong', 'I must protect others from harm' and 'I often take responsibility for things which other people don't think are my fault'. However, it may be that people with generalised anxiety disorder and depression also score highly on this instrument and further investigation of its specificity is required (Salkovskis, 1995; personal communication).

The relationship between exaggerated perceived responsibility and the nature of intrusions has been studied in a series of questionnaires developed by the Quebec group and administered to non-clinical populations. Questionnaires have been developed such as the Cognitive Intrusions Questionnaire (CIQ), and the Inventory of Beliefs Related to Obsessions (IBRO; Freeston et al., 1992a, 1992b; Freeston et al., 1993). The CIQ elicits reports of intrusive thoughts, images or impulses over the past month in a variety of obsessional content areas. The most common intrusions are then rated according to different constructs, including

frequency and associated guilt and responsibility. The 'evaluation' factor (comprising responsibility, disapproval and guilt) was the only significant predictor of compulsive activity and was strongly associated with avoidance. Therefore, as predicted by Salkovskis's model, 'responses to intrusive thoughts are a key variable in the experience of cognitive intrusions'. The IBRO comprises three factors: the first is concerned with responsibility and guilt, the second with overestimation of threat and the third is intolerance of uncertainty. The questionnaire was developed on a normal sample but showed criterion related validity as it discriminated between a small group of obsessionals and a matched normal control group.

The Quebec group has recently developed a semi-idiographic 'Responsibility Questionnaire' to test the validity of the theoretical definition of 'responsibility' (Rheume et al., 1995) and has found a significant relationship between responsibility and obsessive-compulsive symptoms, thought suppression, irrational beliefs and obsessional thoughts. The authors concluded that the results 'provide additional empirical support to the proposed connection between responsibility and the development and maintenance of obsessive-compulsive behaviour'.

This conclusion, however, is not justifiable as it not possible to determine direction of causality from questionnaires and correlational analysis. Only an empirical design with a specific intervention, such as that described below, elucidates causal connections. There are also problems with the nature of the questionnaires. The 'R-scale' confounds items of responsibility about harm with general beliefs about harm such as 'Inactivity can cause as much harm as deliberate bad intentions' , 'Once I have caused harm, I cannot forgive myself' and 'I should never cause even the slightest harm to others'. Items concerning the moral evaluation of cognitions are also included in the questionnaire e.g. ' If I think bad things, this is as bad as doing bad things' (see chapter 6), even though they are not concerned directly

with responsibility for harm.

In summary, the CIQ has not established criterion validity and is not a specific measure of responsibility, although the rating of an idiosyncratic intrusion is more meaningful than rating intrusions that may not have any personal relevance. The IBRO has much potential use but at present the translation from French to English has not been well made and questions remain confusing for many to complete, particularly the item 'Uncertainty should not disturb'.

Although the semi-idiographic 'Responsibility Questionnaire' has the advantage that it is meaningful to the individual concerned, it has contaminated the items about responsibility with OCD itself. The questionnaire therefore does not test the model as all the situations present were obsessional in content. The theory suggests that responsibility is heightened in general and not that people with OCD feel more responsibility than non-obsessionals in specific obsessional situations, such as checking the stove . To state that people with OCD feel more responsible for making sure that the house is locked/germ-free would be purely descriptive and not advance our understanding of the disorder. For example, asking individuals to rate how responsible they feel in the obsessional situation of checking the door confounds responsibility and the disorder.

In summary, at the time of the current study, therefore, there were indications from questionnaires to support Salkovskis's model, but no adequate assessment instrument had been devised.

5.4.3. Manipulation Studies

At least two previous studies have manipulated perceived responsibility. In the first (Gledhill, 1992), responsibility was manipulated in two tasks of low personal relevance which involved making decisions about the shape of beads. Responsibility was increased by

informing 11 OCD and 13 non-clinical subjects that 'the implications of this research are potentially very important and far-reaching. For example, it may be used to advise drug companies on the way they design pills for blind people, who rely mainly on shape to know what type of pill they are taking'. Subjects were asked to rate how responsible they felt for the task; however, it was not possible to test the effectiveness of the manipulation as no base-line measure of responsibility was taken. The responsibility manipulation in this study did not influence state anxiety, accuracy in tasks or time needed to make a decision. However, this may be attributable to a failure to increase responsibility for the task. Since the study was conducted with the experimenter in a white coat (to increase the face validity of the manipulation), it may be that the subjects perceived that the responsibility would primarily be that of the 'doctor' or experimenter.

Secondly, Lopatka and Rachman (1995) have carried out a successful responsibility manipulation in a community of 18 male and 12 female checkers who reached diagnostic criteria for OCD according to the Anxiety Disorders Interview Schedule-Revised (ADIS-R; DiNardo et al., 1985). These subjects had been selected from 221 individuals who had responded to advertisements as fulfilling both the diagnostic criteria and the criterion that the urge to check could be elicited in the presence of the experimenter. The experiment was only conducted with subjects with checking compulsions, as pilot work indicated that responsibility could not be manipulated satisfactorily in subjects with cleaning compulsions.

The manipulation involved two experimenters travelling to the subject's home for a detailed interview. After the DSM III - R criteria for OCD had been met, subjects gave a detailed description of their obsessions and compulsions. Particular attention was paid to the consequences of their obsessions. For example, when the obsessional thoughts and behaviour concerned a fear of burglary with resultant checking of locks and doors, descriptions of the

potential burglary were elicited and specific details obtained.

In the light of this knowledge of the individual difficulties, the therapist asked subjects to describe three different situations in which they would normally feel compelled to carry out checking behaviours. The experimenter and the subject worked together to negotiate the three situations in which the subject would experience discomfort of at least 70 on a 100 point scale and a perceived responsibility for the negative event of 50 on the same 100 point scale.

The experiment had a within-subjects design and each subject was put into the following conditions in a counterbalanced order: high responsibility, low responsibility and a control condition in which responsibility was not manipulated.

In the low responsibility condition, subjects were asked to hand over responsibility to the experimenter, who would assume full responsibility for the consequences of not carrying out the checking behaviour. The experimenter and subject signed a written contract which was also signed by a witness and read aloud to the subject. The subject was instructed to expose himself/herself to the feared situation (e.g. leaving the house without checking the locks) and to refrain from checking. After the subject had undergone exposure but was prevented from carrying out the response, the second experimenter, blind to the condition, asked the subject to rate on a 100 point scale his anxiety/discomfort levels, urge to check, fear of criticism, control, likelihood of the feared consequence and likelihood of panic. To determine the efficacy of the responsibility manipulation, the subjects were also asked how responsible they would feel if their feared consequence occurred.

The same procedure was conducted in the high responsibility condition except that participants were instructed that they were to take full responsibility for the consequences of their actions (or inactivity, i.e. not checking). In the control condition, no instructions were given about responsibility for the outcome.

In summary the manipulation of responsibility was successful. In the control condition, the mean responsibility level was 59/100 points, in the high responsibility condition it was 90/100 points and in the low responsibility condition it was 16/100 points. Furthermore, when responsibility was high, the urge to check and the discomfort experienced were high, but in the low responsibility condition, the urge to check and discomfort experienced were reduced. Interestingly, a series of cognitive biases emerged including the control bias in which subjects felt responsible for events over which they rationally had little or no control, and the probability bias in which they predicted that negative events were more likely if and when they felt responsible for the events.

This experiment was the first of its kind and raised important questions: can the same findings be obtained using different methods of manipulation? Is the importance of responsibility confined to producing checking behaviour or will it also prove important in those with cleaning compulsions? Are the cognitive biases the same in subjects with different phenomenology? The present experiment described below, was designed to address these issues.

5.4.4. Treatment

Cognitive-behaviour therapy specifically targeting appraisals of responsibility was not found to be more effective than exposure in vivo with response prevention (see chapter 2; van Oppen et al., 1995a).

5.4. Summary

Assuming responsibility for negative outcomes is suggested to be at the core of obsessional difficulties (Salkovskis, 1985, 1989, 1995). Data from clinical observation,

questionnaire measures and manipulation of responsibility appear to support this hypothesis. It is concluded that the relationship between obsessional difficulties and the perception of responsibility is worthy of further investigation.

5.5. Pathological responsibility, obsessionality, depression, anxiety and guilt

5.5.1. Background

As outlined above, the cognitive-behavioural model proposes that there is a relationship among responsibility for threat, obsessionality, depression and guilt (see chapter 2). To test this proposition, a measure of responsibility is needed. At the start of the thesis, the Oxford Group were in the process of developing the 'R-scale' (Salkovskis, Gledhill and Reynolds, 1995). Preliminary findings indicated that this measure had criterion validity and that obsessional subjects scored more highly on this measure of responsibility for harm than matched control subjects. Questionnaire items included 'I often feel responsible for things that which go wrong', 'I must protect others from harm' and 'I often take responsibility for things which other people don't think are my fault'. One of the criticisms of this questionnaire is that it does not test the broad notion that perceived responsibility is generally higher in OCD patients than normal controls, because the items assess pathological responsibility that is 'obsessional' in content. For example 'If I know that harm is possible, I should always try to prevent it, however unlikely it seems',' I have to make sure other people are protected from all the consequences of things I do', 'I need to be careful because I may often be close to causing harm'. The question of the assessment of responsibility is addressed in the subsequent study.

Nevertheless, the relationship between this specific, pathological 'obsessional' responsibility and obsessionality, depression, anxiety and guilt is of interest. Twenty years

ago, it was suggested that 'Increases in guilt feelings, evoked directly or mediated indirectly through depression will increase checking behaviour...Reductions in guilt..will result in a decrease in checking behaviour' (Rachman, 1976b, p. 275). Theoretically, guilt should only result if a person feels responsibility for a negative event (Micelli, 1991). Depression is part of the phenomenology of guilt, and two-thirds of people with OCD have a life-time diagnosis of depression (Beck, 1967). Anxiety is related to all these variables - responsibility, obsessionality, guilt and depression (Beck et al., 1985). The cognitive-behavioural model suggests that there is a specific relationship between perceived responsibility and obsessionality, irrespective of guilt, anxiety and depression, although 'this model would predict that increased accessibility ..as occurs in heightened anxiety and depression..would result in clinical worsening of obsessions' (Salkovskis, 1985; p.575). The purpose of this study was to explore the relationships between pathological responsibility, obsessionality, depression, anxiety and guilt, with a view to testing the cognitive-behavioural model.

5.5.2. Aims

The primary aim of the study was to test the cognitive-behavioural model by exploring the relationships between pathological responsibility, obsessionality, depression and guilt. A second aim of this study was to generate data to test the 'heterogeneity hypothesis' (see chapter 9).

5.5.3. Hypothesis and Predictions

Hypothesis 1 There is a specific relationship between pathological responsibility and obsessionality.

Prediction 1 There will be significant positive correlations between the R-scale and measures of obsessionality when the effects of depression, anxiety and guilt are controlled .

Hypothesis 2: There is a specific relationship between pathological responsibility and guilt.

Prediction 2: There will be significant positive correlations between the R-scale and measures of guilt after controlling for the effects of depression and anxiety.

5.5.4. Method

Subjects

101 people living in the community who had a significant number of obsessional symptoms (>11 on the Maudsley Obsessive-Compulsive Scale) completed a series of questionnaires to assist in research into OCD. Advertisements for the project had been placed in women's magazines. 81% of the sample were female. The mean age of the sample was 36 years, 5 months (sd=11.25; range 18-70).

Measures

The R - Scale (Salkovskis, Gledhill and Reynolds, 1995). This is a 43-item scale assessing pathological responsibility. All items except for 2 are self-referent; all items are positively scored on a range of 1 'totally disagree' to 7 ' totally agree'. Examples of items include 'If I don't act when I can foresee danger, then I am to blame for any consequences if it happens'; 'I often cause harm" If I cannot be certain I am blameless, I feel that I am to blame'.

The Beck Anxiety Inventory (BAI: Beck, Epstein, Brown and Steer, 1988). This

is a 21-item scale comprising symptoms of anxiety. The scale measures the severity of anxiety in adults and children and symptoms are rated on a 4-point scale ranging from 0 ('not at all') to 3 ('severely: you could barely stand it). This measure is considered to assess clinical anxiety more accurately than other measures such as Spielberger's measure of trait anxiety (Spielberger et al., 1980).

Guilt Inventory (GI; Kugler and Jones, 1992). This is a 45-item self-report inventory designed to assess the following domains: *trait guilt*, defined as a continuing sense of guilt beyond immediate circumstances (e.g., 'Guilt and remorse have been a part of my life for as long as I can recall,' 'I often have a strong sense of regret,' and 'Frequently I just hate myself for something I have done'); *state guilt*, defined as present guilty feelings based on current or recent transgressions (e.g., 'At the moment, I don't feel particularly guilty about anything I have done,' 'I have recently done something that I deeply regret,' and 'Lately, I have felt good about myself and what I have done'); and *moral standards*, defined as subscription to a code of moral principles without reference either to specific behaviours or overly specific beliefs (e.g., 'I believe in a strict interpretation of right and wrong,' 'What is right and wrong depends on the situation,' 'I have always believed strongly in a firm set of moral-ethical principles.' (see chapter 4).

The Beck Depression Inventory (Beck et al. 1961). This is a 21-item inventory designed to assess the symptoms of depression in the past week. Subjects are required to respond on a 4 point scale ranging from 0 (the subject does not have that symptom) to 3 (the symptom is very marked).

Padua Inventory - Revised (P I-R; Sanavio, 1988; van Oppen, 1995c). This is a 41-item list of common obsessional thoughts and compulsive behaviours (see appendix 1). It was revised from an earlier 60-item list. Each of the 41 items is rated on a five-point scale in terms of the frequency with which it is experienced. The scale points are labelled from `not at all' (score of zero) to `very much' (score of four). All items are negatively phrased (`I feel my hands are dirty when I touch money'). An investigation into the factor structure of this measure for a British obsessional population can be found in appendix 1.

Maudsley Obsessional Compulsive Inventory (MOCI; Hodgson and Rachman, 1977). This is a 30-item questionnaire. Subjects are requested to respond `TRUE' or `FALSE' to each item. There are four subscales: checking, washing, doubting and slowness.

5.5.5. Results

The alpha level was set at 0.01 to compensate for the number of computations. Missing values were replaced with the series mean for all analyses.

Pearson's correlation coefficients were computed to determine the associations between responsibility, obsessionality, depression, anxiety and guilt. The coefficient matrix is shown in Table 5.1.

Table 5.1 Pearson product-moment Correlation Matrix showing associations between pathological responsibility and obsessions, depression, anxiety and guilt.

n~108	R - SCALE TOTAL
	Correlation Coefficient
PI (R)	
Impaired Control over mental events	.4602**
Contamination	-.0187
Checking	.3614**
Rumination	.5602**
Precision/Order	.3215**
Total	.4715**
MOCI	
Checking	.4122**
Washing	-.0019
Doubting	.1960
Slowness	-.0903
Total	.2677**
Guilt	
Standards	.1546
State	.4502**
Trait	.5118**
Total	.5130**
Beck Anxiety Inventory	.4194**
Beck Depression Inventory	.4738**

** = p<0.01

The correlation matrix indicated that pathological responsibility was significantly associated with checking behaviour on both the PI-R and the MOCI, and was not associated with washing/contamination on either of these measures. Although related to the other subscales of the PI-R, the R - Scale was not related to the other subscales of the MOCI. The R - Scale was significantly associated with depression, anxiety and all measures of guilt except for guilt standards.

Prediction 1

The analyses were repeated to determine whether the correlation between the R - Scale and measures of obsessionality remained when the effects of guilt, depression and anxiety were partialled out. The correlation coefficient matrix is shown in table 5.2

Table 5.2 Pearson product-moment Correlation Matrix showing associations between pathological responsibility and obsessions, controlling for depression, anxiety and guilt.

n~96	R- Scale Total
PI (R)	Correlation Coefficient
Impaired mental Control	.2188
Contamination	-.2098
Checking	.2872 **
Rumination	.3003**
Precision/Order	.1678
Total	.1857
MOCI	
Checking	.2190
Washing	-.2163
Doubting	.0276
Slowness	-.1495
Total	-.0536

** $p<0.01$

The association between pathological responsibility and checking behaviour on the PI-R remained significant, and there was a non-significant trend for pathological responsibility to be associated with checking behaviour on the MOCI. There was a significant association between rumination on the PI-R and pathological responsibility. Neither the total scores nor any other subscales were significantly related to pathological responsibility.

Prediction 2

The analyses were repeated to determine whether the correlation between the R - Scale and guilt remained when the effects of depression and anxiety were partialled out. The correlation coefficient matrix is shown in table 5.3:-

Table 5.3 Pearson product-moment Correlation Matrix showing associations between pathological responsibility and guilt, controlling for the effects of depression and anxiety.

n~96	R - SCALE TOTAL
	Correlation Coefficient
GUILT	
State	.2167
Trait	.3330**
Standards	.2098
Total	.3388**

**p<0.01

The results showed a significant association between pathological responsibility and total guilt. The association between trait guilt and pathological responsibility was significant and there was a trend for guilt standards and state guilt to be related to pathological responsibility.

Summary of Results

Prediction 1: There is a specific relationship between pathological responsibility and obsessionality. The results partially supported this hypothesis. There was evidence for a specific relationship between pathological responsibility and checking behaviour in particular, but the evidence for relationship between pathological responsibility and other obsessional features was weaker.

Hypothesis 2: There is a specific relationship between pathological responsibility and guilt. The results partially supported this hypothesis. There was evidence for a specific relationship between pathological responsibility, trait guilt and overall guilt. There was a trend for state guilt to be associated with pathological responsibility.

5.7.6. Discussion

Overall, the results showed partial support for the cognitive-behavioural model in that pathological responsibility was associated with obsessional symptoms and with depression, anxiety and guilt. Nevertheless, a specific association between pathological responsibility and checking behaviour, which was not accounted for by these variables was found. Also of interest and in need of explanation is that the association between guilt standards and pathological responsibility increased once the effects of depression and anxiety were partialled out. Since this association was not significant, it may be a chance statistical finding.

5.6. A study of General Perceived Responsibility: Structure and Significance

This work was carried out in conjunction with Rachman, Thordarson and Woody at the University of British Columbia, Vancouver. I was involved with designing the questionnaire, collecting and analysing the data. Professor Rachman led the research team and wrote-up the results for publication (1995); Dana Thordarson assisted with data analysis and Sheila Woody contributed to the questionnaire design.

5.5.1. Background

Given the data from psychometric, experimental and clinical studies connecting inflated responsibility with OCD, there was a strong need for a reliable and valid measure of

responsibility which was not confounded with the disorder itself. The R-scale described in the previous study could be considered to be circular, as it was assessing responsibility in obsessional situations as opposed to general increased levels of responsibility. The literature review and previous study indicated that there may be a stronger relationship between responsibility and checking behaviours than other obsessional complaints. Furthermore, the relationship between responsibility and other clinical variables such as guilt and anxiety warranted further exploration.

5.6.2. Aims

The main aim of the study was to produce a reliable scale, free from obsessional content, for measuring responsibility. A second aim was to investigate the relationship between responsibility and obsessionality, guilt and depression.

5.6.3. Hypotheses and Predictions

Hypothesis 1

Perceived responsibility is related to obsessionality

Prediction 1

There will be a significant positive correlation between responsibility and obsessional behaviour.

Hypothesis 2

The relationship between responsibility and checking behaviour will be stronger than the relationship between responsibility and washing/cleaning behaviour.

Prediction 2

The correlation between responsibility and the checking subscales will be stronger than the correlation between responsibility and the washing/cleaning subscales.

Hypothesis 3

Responsibility will be related to depression and guilt.

Prediction 3

There will be a positive correlation between measures of responsibility and depression and guilt.

5.6.4. Part 1. Development of the 'Responsibility Appraisal Questionnaire'

The study was carried out in two parts. The purpose of the first part of the study was to develop a questionnaire to assess responsibility in normal subjects. A pool of items was written and administered to undergraduate students; their responses were used to select the best items for a final scale.

5.6.4.1. Method

Subjects

The subjects were 291 psychology students at the University of British Columbia who completed the questionnaire package for course credit. Their average age was 19.5 years; 72% of the sample was female.

Measures

We devised a pool of 36 items to assess responsibility in five content areas:

- responsibility for property damage (e.g. if I smelled smoke in a store, it is (not)up to me to inform the manager);
- responsibility for physical harm coming to other people (e.g. when driving it is (not) up to me to make sure that my passengers are wearing safety belts)
- responsibility in social contexts (e.g. I should not turn down an invitation from a friend);
- responsibility which is positive (e.g. I would welcome the opportunity to be put in charge of the safety of buildings)
- thought-action fusion (TAF) which is the belief that thoughts can influence events (e.g. My mean thoughts wishing a person harm can increase the chance that something harmful will happen to him/her) or the belief that thoughts are almost the moral equivalent to actions (e.g. For me, having a mean thought is (not) as bad as doing something mean) (see chapter 6 and Rachman, 1993).

Particular care was taken to avoid items with obsessional content. Approximately half the items were reverse-coded. Subjects endorsed each item on a visual analogue scale from 0 to

100.

5.6.4.2. Results

A principal components analysis with varimax rotation performed on the 36 items indicated that the best simple structure was obtained using a 2 or 4 factor solution. The 4 factor solution was selected because it nearly corresponded to our original 5 domains of responsibility. The 4 factor solution, which accounted for 30.9% of the variance, approximated the domains of responsibility for harm (incorporating both physical harm and property damage; 11.4% of variance), social responsibility (7.4% of variance), positive responsibility (5.5% of variance) and thought-action fusion (TAF; 6.6% of variance). The four-factor solution can be seen in Table 5.4.

Table 5.4 The Four-Factor Rotated Factor Solution for the 36-item RAQ.

	Harm (Factor 1)	Social (Factor 2)	Thought-Action Fusion (Factor 3)	Positive (Factor 4)
It is not particularly important to me to take special care when driving during school opening hours	**.64921**	-.13301	.14025	.00414
It is okay to wish misfortune on other people	**.54162**	.12358	.30463	-.22647
If I smelt smoke in a store, it is not up to me to inform the manager	**.53826**	.02778	-.04982	-.01525
If I knew I woudn't be caught I would drink and drive	**.49612**	.03724	.10782	-.06738
It is not important to me to ensure the brakes of my car are in perfect working condition	**.46264**	-.04467	.17646	.11736
It is not important to me to always remember to send a card or call on friends' birthdays	**.43856**	.11837	-.09203	.04555
It is not important to me to return a borrowed book in the same good condition as I received it	**.40604**	.01746	.02786	.04433
If I borrowed $1, it is not important to me to repay it	**.38650**	-.17931	.02038	.27061
When driving, it is not up to me to make sure that my passengers are wearing safety belts	**.33380**	.08476	-.07083	.14145
When I am in a restaurant with friends, it is up to me to personally ensure that we have left a large enough tip	-.07431	**.62841**	.07481	-.03883
It is up to me to protect other people from harm	-.05779	**.58743**	-.05028	.27281
I am obliged to lend a friend money if asked	-.16678	**.53375**	.20478	.02149
If a child looks lost in a supermarket, it is up to me to take the child to the store manager	.40361	**.50202**	-.13736	.00002
I should not turn down an invitation from a friend	-.19244	**.49765**	.21827	.09761
It is up to me to hand in a stranger's wallet to the police if I see it lying in the street	.32617	**.44743**	-.25882	-.01529
If I know road conditions are dangerous, it is my duty to tell a friend	.31337	**.42372**	.04699	.19805
It is my duty to take care of a stray	.02969	**.42200**	-.13347	-.01958

Table 5.4. cntd...The Four-Factor Rotated Factor Solution for the 36-item RAQ.

	Harm (Factor 1)	Social (Factor 2)	Thought-Action Fusion (Factor 3)	Positive (Factor 4)
It is important to me to fulfill my social obligations	.09559	**.41372**	.04989	.26555
It is not my duty to always help a friend in need	.22371	**.37912**	-.07030	-.04782
When going out socially, it is not my role to ensure that everyone has a good time	.02023	**.28476**	.28462	.01477
My mean thoughts wishing a person harm cannot increase the chance that something harmful will happen to him/her	-.14812	-.06231	**.61923**	.12624
It is important to me to make sure that I don't have impure thoughts	.06411	.10279	**.57344**	-.05012
If I have a thought about something horrible happening to an acquaintance, it may bring them bad luck	-.05089	.18265	**.51370**	.09578
For me, having a mean thought is not as bad as doing something mean	.11051	-.05232	**.51001**	-.04730
I would carry a passenger in the car when road conditions are dangerous	.35359	-.09721	**.48504**	-.07336
My mean thoughts cannot have the same consequences as my mean actions	.06659	-.20613	**.44501**	-.01905
I do not feel obligated to give money to panhandlers	-.05606	.30049	**.39457**	-.25976
It is important to me to never serve food to people that is a little past the due date	.17672	.20415	**.22896**	.15201

Table 5.4. cntd...The Four-Factor Rotated Factor Solution for the 36-item RAQ.

	Harm (Factor 1)	Social (Factor 2)	Thought-Action Fusion (Factor 3)	Positive (Factor 4)
I welcome the opportunity to take on new responsibilities	.08376	.06487	-.08063	**.68651**
I would welcome the opportunity to be put in charge of the safety of buildings	-.11096	.07040	.12068	**.65647**
I would welcome the opportunity to take the lead in team projects/events	-.13125	.00622	-.09854	**.61200**
If I accidentally break a friend's pen, it is important to me to replace it	.37947	.13024	.23484	**.41260**
It is up to me to make sure that a child does not eat food that has fallen on the floor	.22724	.26518	.20768	**.35184**
Before buying a gift, I make sure it is in perfect condition	.15899	-.02299	.32934	**.34952**
I do not welcome the opportunity of being entrusted with other people's belongings	.23553	.09825	-.20269	**.31506**
If I saw someone acting suspiciously, it is up to me to telephone the police	.18664	.27464	-.01726	**.28731**

From the original pool of 36 items, 18 were retained to form the final scale with subscales based on the four factors. Three criteria were used in the selection of items:

- loading only on their hypothesized factor (harm, social, positive, or TAF)
- high item-total and item-subscale correlations
- mean response not extremely high (to maximize the ability of the scale to discriminate among subjects at high levels of responsibility.

Cronbach's alpha coefficient was computed for all four subscales. The coefficient alphas were: 0.56 for Harm (5 items), 0.46 for Social (5 items), 0.58 for Positive (4 items), and 0.51 for TAF (4 items). Only the subscales of Harm and TAF, and Social and Positive were correlated ($r=0.18$, $r=0.17$ respectively; $p<0.01$).

The revised Responsibility Appraisal Questionnaire (RAQ) was administered to a new sample to verify its factor structure and investigate its relationship with other variables such as obsessionality, depression and anxiety (see Part 2).

5.6.5. Part 2. Correlates of Responsibility

The association between responsibility, as measured by the subscales of the revised RAQ, and obsessionality, depression and guilt was investigated.

5.6.5.1. Method

Subjects

The subjects were 234 psychology students at the University of British Columbia who completed the questionnaire package for course credit. Their average age was 20 years; 68% were female.

Measures

The following questionnaires were completed.

RAQ.: The 18 item revised RAQ, with instructions to rate agreement with the statements on a six point scale, ranging from '1' (absolutely disagree) to '6' (absolutely agree).

Maudsley Obsessional Compulsive Inventory (MOCI). (Hodgson and Rachman, 1977; see chapter 3). This is a 30 item true/false inventory with subscales of cleaning, checking doubting/conscientiousness and slowness.

Beck Depression Inventory (BDI). (Beck,1967). This is a 21 item inventory to assess the severity of depression.

Guilt Inventory (GI). (Kugler and Jones, 1992). This is a 45 item questionnaire comprising subscales of trait guilt, state guilt and guilt standards. Subjects endorse items on a scale of '1' (very untrue of me, or strongly disagree) to '5' (very true of me, or strongly agree). (see chapter 4).

The Inventory of Beliefs Related to Obsessionality (IBRO). (Freeston, Ladouceur, Thibodeau & Gagnon, 1993). This is a 20 item inventory in which subjects endorse beliefs on a scale of '1' (I believe strongly that this statement is false) to '6' (I believe strongly that this statement is true).

5.6.5.2. Results

A principal components analysis with varimax rotation was performed on the 18 items. A four-factor solution accounted for 46.2% of the variance and corresponded to our four domains of responsibility from the first part of the study. The factors for TAF and Positive Responsibility were most coherent, whereas two Social and one Harm item unexpectedly loaded on factors other than their own. The factor solution can be seen in Table 5.5.

Table 5.5. The Four-Factor Rotated Factor Solution for the 18-item RAQ.

	Thought-Action Fusion (Factor 1)	Positive (Factor 2)	Social (Factor 3)	Harm (Factor 4)
If I have a thought about something horrible happening to an acquaintance, it may bring them bad luck	**.84370**	.01328	.00682	-.07574
My mean thoughts wishing a person harm can increase the chance that something harmful will happen to him/her	**.78418**	.06678	-.06945	-.14886
My mean thoughts can have the same consequences as my mean actions	**.77128**	-.12788	-.03881	.05151
For me, having a mean thought is almost as bad as doing something mean	**.61656**	-.05926	.15424	.32538
I would be able to turn down an invitation from a friend	**.39437**	-.22562	.19668	.12541
I would welcome the opportunity to take on new responsibilities	-.02481	**.73416**	.10571	-.00506
I would welcome the opportunity to take the lead in team projects/events	-.06450	**.73349**	-.02541	-.05872
I would welcome the opportunity to be put in charge of the safety of buildings	-.03163	**.70433**	-.05963	.01494
I would welcome the opportunity of being entrusted with other people's belongings	-.07182	**.51509**	.29206	.09801
I would inform the manager if I smelt smoke in a store	-.02723	**.44387**	.38251	.11392

PAGE
MISSING
IN
ORIGINAL

Table 5.5 contd.. The Four-Factor Rotated Factor Solution for the 18-item RAQ.

	Thought-Action Fusion (Factor 1)	Positive (Factor 2)	Social (Factor 3)	Harm (Factor 4)
It is important to me to fulfill my social obligations	-.00440	-.01645	**.72693**	-.06516
I would remember to send a card or call a friend on his/her birthday	.00544	.08568	**.56571**	.09632
I would take special care when driving near a playground	.02922	.17625	**.55315**	.34069
I would be obliged to lend a friend money if asked	.21348	.04978	**.44786**	-.21219
I would carry passengers in the car when road conditions were dangerous	.19473	**-.12470**	.02461	**.72380**
If my car were making an unusual noise, I would continue to drive it	-.00086	.00803	.04273	**.57513**
When I am in a restaurant with friends, it is up to me to personally ensure that we have left a sufficiently large tip	.03736	-.21808	.35848	**-.53869**
I would return a borrowed book which I had slightly torn without saying anything	-.07572	.05988	.28649	**.38458**

The means, standard deviations and internal consistencies of the RAQ subscales are given in Table 5.6. MOCI scores ranged from 0 to 20 (M=7.60, sd=4.64); BDI scores ranged from 0 to 43 (M=9.26, sd=7.08). The means of the MOCI and BDI were, as expected, in the non-clinical range.

Table 5.6. Descriptive Statistics for the RAQ Subscales: Study 2

Subscale	No. Items	Mean	SD	Cronbach's Alpha
TAF	4	8.57	3.32	0.76
Positive	4	15.72	3.31	0.66
Social	5	19.68	2.97	0.40
Harm	5	19.98	3.40	0.43

Pearson product-moment correlation coefficients were calculated to investigate the relationships between RAQ subscales and measures of obsessionality, depression and guilt (see correlation matrix in Table 5.7.)

These subscales were based on the original items suggested to comprise the factors, as opposed to the results of the factor analysis.

Table 5.7. Pearson product-moment correlations among RAQ subscales and measures of obsessionality, depression and guilt.

	TAF	Positive	Social	Harm
MOCI - total	.45**	-0.1	.17*	.05
MOCI - washing	.35**	-.04	.06	.06
MOCI - checking	.41**	-.12	.09	.04
MOCI - doubting	.26**	.02	.23**	.12
MOCI - slowness	.10	-.02	.09	.04
IBRO	.50**	-.12	.20*	.07
BDI	.38**	-.17*	.12	.09
Guilt trait	.34**	-.13	.16	.01
Guilt state	.34**	-.13	.12	-.02
Guilt standards	-.01	.12	.13	.21*

* $p<0.01$ ** $p<0.001$

Of the RAQ subscales, TAF was most strongly correlated with measures of obsessionality, particularly the IBRO. TAF was also associated with depression and guilt measures. Partial correlation coefficients, controlling for BDI scores, were also computed. All significant correlations between the RAQ subscales, including the TAF subscales and measures of obsessionality remained significant after partialling out the BDI scores. However, after controlling for the effects of depression, the correlations between RAQ subscales and guilt were no longer significant.

It is possible that high MOCI scorers (i.e. subjects who score within the clinical range) are qualitatively different from other subjects. Therefore analyses were conducted comparing subjects scoring above a clinical cutoff of 15 on the MOCI with the rest of the sample. The

TAF scores of high MOCI scorers were significantly greater than those of the rest of the sample, but there were no differences between groups on the other RAQ subscales (see table 5.8).

Table 5.8. High MOCI Scorers (n=23) vs Rest of Sample (n=210).

	Rest of Sample	High Scorers	t
RAQ-TAF	8.2 (3.2)	11.7 (3.1)	-5.1**
RAQ-Positive	15.8 (3.4)	15.0 (2.5)	1.1
RAQ-Social	19.6 (3.0)	20.0 (2.5)	-.6
RAQ-Harm	19.9 (3.5)	20.7 (2.8)	-1.0
IBRO	64.5 (10.3)	74.0 (8.1)	-4.2**
BDI	8.6 (6.5)	15.2 (9.5)	-4.3**
Guilt trait	56.6 (12.4)	64.3 (9.7)	-2.9*
Guilt state	29.3 (7.6)	34.7 (6.8)	-3.3*
Guilt standards	44.8 (5.2)	48.3 (4.5)	-3.1*

* $p<0.005$ ** $p<0.001$

The results are consistent with the suggestion that TAF is implicated in obsessionality, but that responsibility in general may not be elevated in OCD.

5.6.6. Summary of Results of the Two Studies

Prediction 1: There will be a significant relationship between responsibility and obsessional behaviour. This prediction was partially fulfilled. There was no significant relationship between obsessional behaviour and the RAQ subscales of Harm, Positive or Social (with the

exception of a correlation with the doubting subscale of the MOCI). However, the TAF subscale was strongly associated with all subscales of the MOCI, except for slowness.

Prediction 2: The relationship between responsibility and checking behaviour will be stronger than the relationship between responsibility and washing/cleaning behaviour. This prediction could be tested with respect to the TAF subscale of responsibility only, since this was the only subscale which showed any relationship with the MOCI subscales. The prediction was **not** fulfilled with respect to the TAF subscale. The correlation of TAF with the checking subscale of the MOCI was higher than that of the cleaning subscale ($r=0.41$ and $r=0.35$) respectively, **but this difference was not statistically significant ($p>0.05$).**

Prediction 3. Responsibility will be related to depression and guilt. This prediction was partially fulfilled. The TAF subscale was significantly correlated with scores on the BDI, and with state and trait guilt, but not with guilt standards. There was a significant negative correlation between Positive responsibility, and trait guilt and BDI scores, and between Harm and guilt standards. However no relationship was found between the Harm or Social subscales, and scores of depression, state guilt and trait guilt.

5.6.7. Discussion

The results of the two studies show the need to qualify the original, broad view of inflated responsibility. The postulated connection between inflated responsibility and obsessional-compulsive problems appears to be more situation-specific and idiosyncratic than was originally assumed. The idea that people affected by obsessional problems are broadly

over-responsible is difficult to support. Furthermore, even some patients with severe OCD problems and definite evidence of inflated responsibility nevertheless seek and welcome specific types of responsibility (e.g., teachers with OCD who still enjoy the responsibility of looking after a class of children, but avoid checking gas taps).

The results of the studies indicated a relationship between TAF and measures of obsessionality. In this study, the TAF subscale comprised four questions - two relating to the 'moral equivalence' component of TAF, and two relating to the belief that thoughts may influence events (the 'likelihood' component). Given these encouraging results, a further study was conducted to explore the relationship between TAF and obsessionality. Further exploration was also warranted, as there were indications that TAF was more strongly related to checking than cleaning behaviour, although there were significant associations with both subscales of the MOCI. The TAF subscale was also related to depression and guilt state and guilt trait measures in this second study, but not to guilt standards. This was a somewhat surprising result, as the guilt standards subscale is designed to assess moral standards held by the individual, and part of TAF assesses beliefs about the morality of thoughts and actions. A number of explanations for this result are possible. It may be that the guilt standards subscale is not valid, and some evidence for this was found in the study of guilt and obsessionality reported in chapter 4. Alternatively, it may be that people with OCD do not have high moral standards <u>in general</u>, but it is a <u>specific</u> type of morality concerning thoughts and actions that is associated with OCD. This explanation is in keeping with results from the study of religion and OCD (see chapter 4), and from this study which indicates that connections between responsibility and obsessionality are probably situation-specific and idiosyncratic, rather than broad and commonly held.

There are several arguments in favour of a situation- specific explanation for the

importance of perceived responsibility in OCD. Firstly, there is far more inflated responsibility than there is OCD. Hence, inflated responsibility (IR) by itself is not sufficient to account for OCD-possibly because IR is too broadly conceived. Presumably, it is only certain manifestations of IR that contribute to OCD (e.g. Rheume et al., 1995). Secondly, the psychometric studies failed to reveal a unitary factor of responsibility, and the total scores on the Responsibility (R) scale showed little relation to the OCD measures. Only one of the factors on the R scale, thought-action fusion, correlated with aspects of OCD, particularly with the measure of beliefs related to obsessionality (IBRO). This relationship is to be expected, given that the IBRO has a number of items concerning beliefs about thoughts (e.g. 'Guilt is an appropriate response to unacceptable thoughts'). In the Lopatka experiment on induced responsibility, considerable effort and time had to be devoted to identifying the exact actions that were responsible for shifts in responsibility; it was not possible to construct a set of standardised instructions that would apply across the board (Lopatka, 1992, personal communication). The subjects had specific, idiosyncratic ideas of responsibility and of the misfortunes that might occur if they failed to exercise their self-determined responsibility.

Similarly, in the early experiments by Rachman and Hodgson (1980) on compulsive checking, the variability (and at that time, the lack of predictability) of the patient's sense of responsibility was a hindrance. Specific and idiosyncratic expressions of responsibility were common, and broad, universally experienced expressions of responsibility were unusual (Rachman et al., 1995).

Even patients who report high levels of inflated responsibility are easily able to delineate those tasks/events which evoke no responsibility at all. Further, as noted earlier, even patients who are tormented by highly irrational responsibility can describe specific situations in which they welcome responsibility.

The results do not support the idea that people with OCD may have generally inflated responsibility, and subjects with MOCI scores within the clinical range were as likely as other subjects to welcome some forms of responsibility. The presence of OCD tendencies does not necessarily eliminate or even suppress the acceptance of responsibility. All of this suggests that the inflated responsibility which plays a part in OCD must be situation specific; it is not general and does not preclude acceptance of certain forms of responsibility.

It is possible, of course, that the RAQ scale is not sufficiently sensitive for the purpose. However, Rheume et al., (1995) found that it was specifically pivotal responsibility that may be the key factor. The association with OCD may come into play only when the affected person feels solely or mainly responsible for the anticipated harmful event (i.e., feels pivotally responsible). The inclusion of items designed to tap feelings of pivotal responsibility may increase the sensitivity of the RAQ, and then reveal a degree of association between OCD and inflated responsibility that extends beyond TAF. It is important, however, to balance the need for an assessment of responsibility that is person and situation-specific with an assessment that is not confounded by including obsessional situations.

One of the criticisms that could be levelled at this study is that a non-patient sample was used. However, one of the fundamental assumptions of the cognitive-behavioural model is that intrusions are a normal phenomenon (Salkovskis, 1985, p.577). Furthermore, a recent study suggested that non-patient samples could be utilised in the study of OCD if one targets the top 2% of scorers as those likely to have a clinical disorder (Burns et al., 1995).

The concept of psychological responsibility appears, then, to be multi-factorial. To date, only one of the four psychometric factors, TAF, seems to relate to OCD. From the assessment point of view, the use of a general measure of responsibility may make little difference, except perhaps as a baseline. The TAF factor score showed more promise and

warrants psychometric development. A study investigating TAF and its relationship to obsessionality is reported in chapter 6.

5.6.6. Summary

In summary, there was little relationship between the measure of responsibility and measures of obsessional symptoms. The most likely explanation is that the postulated association between responsibility and OCD is situation-specific and that people with obsessional problems do not have a broad inflation of responsibility, but that it is inflated idiosyncratically. Furthermore, some OCD patients seek some type of responsibility (e.g. teachers) whilst avoiding others (e.g. making sure the gas is off). A series of arguments supporting the view that in OCD responsibility is inflated in only specific situations can be found in Rachman et al., (1995). The relationship between TAF and OCD was the most promising and is explored further in chapter 6.

5.7. Manipulation of Responsibility

5.7.1. Background

The results from the previous study did not find a relationship between the broad concept of inflated perceived responsibility and obsessional symptoms. However, results from clinical experience and empirical studies in which responsibility is manipulated, provide strong evidence for the importance of the role of responsibility in OCD.

The manipulation of responsibility is probably one of the most important methods by which the role of responsibility in OCD may be elucidated. One of the arguments that has been made against the emphasis on the role of responsibility is that 'there may be a tendency

to mistake therapeutic techniques for theory' (Jakes, 1993). Jakes asks the question 'Why should one not suppose that anyone who experienced, say, obsessional impulses to harm their relatives with the frequency and intensity with which such impulses are experienced by those OCD patients for whom they are a major problem, would be similarly inclined to think badly of themselves as a result?.... On this argument, then, the sense of responsibility and guilt etc. experienced by OCD patients who suffer from aggressive, sexual or blasphemous obsessions may indeed be producing at least some of their distress, but this sense of responsibility and guilt may nonetheless be regarded as a 'normal response' to their abnormal experience...The argument suggests then, that the cognitive-behavioural account may place the cart before the horse in assigning the feelings of responsibility and guilt experienced by these kinds of OCD patients a primary role, and it is perhaps best to suspend judgment, therefore, as to whether these feelings may be assigned such a role' (Jakes, 1993).

One of the methods that may be used to refute Jakes's argument is an experimental design. If obsessional symptoms are shown to vary IN RESPONSE to the manipulation of responsibility, this gives some indication that, in Jakes's words, the horse comes before the cart. If obsessional symptoms led to feelings of responsibility, then altering the perceived responsibility would not, according to this model, greatly alter the obsessional symptoms.

The manipulation of responsibility by Lopatka and Rachman was successful (1995), and the study has been described in detail previously. In summary, in situations of high responsibility, the urge to perform compulsive 'neutralising' behaviours, anxiety experienced and estimates of the probability of threat all increased. Feelings of control over the threat did not change in the high responsibility condition. It is interesting that feelings of perceived control which should, by logic, be closely related to feelings of responsibility did not change in the different conditions. This may imply that the logic which governs most people's

perception of responsibility (and involves estimations of control over negative events) is different in people with OCD. The manipulation study was conducted only with people with checking compulsions, as pilot work indicated that the responsibility manipulation was not effective in people with other compulsive behaviours. This study provided strong support for aspects of the cognitive-behavioural model of OCD. However, the method by which responsibility was manipulated was somewhat artificial and involved the use of contracts. Therefore it is possible that the results were obtained owing to the non-specific effects of experimenter demands, although this is unlikely. The present study aimed to use a more natural manipulation of responsibility for the dual purpose of replicating the findings of Lopatka and Rachman, and extending it by comparing patients with both checking and cleaning compulsions. Given the suggestion that 'when the affected person experiences an unwanted obsessional thought, he/she feels unduly responsible for the thought and its significance' (Rachman, 1993; emphasis added), the study was extended to include separate assessments of the perceived responsibility for the threat, and perceived responsibility for the thought. However, it was expected that when responsibility for the threat was high, responsibility for the intrusive thought would also be high.

The method chosen of manipulating responsibility arose from the clinical observation that 'most checking rituals are carried out when the person is alone..the rituals are most intense when a person feels responsible for the act concerned'. (Rachman, 1976b; p.270). Further clinical observations included 'it has proved easier under ..experimental conditions ...to provoke anxiety discomfort among compulsive cleaners than among compulsive checkers' (Rachman, 1976b; p.273). It is possible, therefore, that responsibility plays a greater part in checking rituals compared to cleaning rituals. In addition, some checking behaviours could not be elicited if the patient was in the presence of someone that he/she trusted (spouse or

therapist). The reason for these observations may concern responsibility. When the person is alone, he/she may feel more responsible for a negative outcome than when someone else is present. This 'diffusion' of responsibility is well documented in social psychology, where the degree of responsibility is inversely proportional to the number of people present (e.g. Latané and Darley, 1970). Given the close relationship between anxiety and compulsions (see chapter 3), it is also possible that perceived responsibility affects the degree of discomfort/anxiety, anxious cognitions and fear sensations that may be experienced during exposure in vivo with response prevention.

The present study based the manipulation of perceived responsibility on clinical observations, and hypotheses and predictions were based on these observations and the findings from the manipulation study of Lopatka and Rachman (1995). The 'high' responsibility condition involved the subject undergoing exposure in vivo with response prevention when alone. The 'low' responsibility condition involved the subject undergoing exposure in vivo in the presence of the experimenter.

5.7.2. Aims

To use an ecologically valid manipulation of responsibility to:

- investigate the effect of manipulating responsibility on obsessional cognitions and also on anxious cognitions and fear sensations
- compare the effect of manipulating responsibility on checking and cleaning compulsions.

5.7.3. Hypotheses and Predictions

Based on clinical observations and the work of Lopatka and Rachman (1995), the

following hypotheses and predictions were made:

- *Hypothesis 1.* Perceived responsibility for threat will vary according to the presence/absence of an experimenter
- *Prediction 1.* Perceived responsibility for threat will be higher when a subject conducts exposure in vivo with response prevention alone, than when a subject conducts exposure in vivo with response prevention in the presence of an experimenter.

- *Hypothesis 2.* There is a causal relationship between perceived responsibility for threat and the urge to perform compulsive 'neutralising' behaviours.
- *Prediction 2a* The urge to perform compulsive neutralising behaviours will be higher when undergoing exposure with response prevention in the high responsibility condition (subject alone) than in the low responsibility condition (subject + experimenter).
- *Prediction 2b.* There will be significant positive correlations between estimates of perceived responsibility for threat and the urge to perform compulsive 'neutralising' behaviours.

- *Hypothesis 3.* There is a causal relationship between perceived responsibility for threat and discomfort/anxiety.
- *Prediction 3a.* Discomfort/anxiety will be higher when undergoing exposure with response prevention in the high responsibility condition (subject alone) than in the low responsibility condition (subject + experimenter).

- *Prediction 3b*. There will be significant positive correlations between estimates of perceived responsibility for threat and discomfort/anxiety.

- *Hypothesis 4.* There is a causal relationship between perceived responsibility for threat and perceived responsibility for thoughts.
- *Prediction 4a*. Perceived responsibility for thoughts will be higher when undergoing exposure with response prevention in the high responsibility condition (subject alone) than in the low responsibility condition (subject + experimenter).
- *Prediction 4b*. There will be significant positive correlations between estimates of perceived responsibility for threat and perceived responsibility for thoughts.

- *Hypothesis 5.* Estimations of the probability of threat are dependent upon perceived responsibility for threat; estimates of the controllability of threat are not.
- *Prediction 5a.* The estimations of the probability of threat will be higher in the high responsibility condition (subject alone) than in the low responsibility condition (subject + experimenter), but the estimations of the controllability of threat in the high responsibility condition (subject alone) will not differ from those in the low responsibility condition (subject + experimenter).
- *Prediction 5b.* There will be significant positive associations between responsibility for threat and estimates of the probability of threat, but not between responsibility for threat and estimates of the controllability of threat.

- *Hypothesis 6.* Manipulation of perceived responsibility, and its effects, will be different for 'checkers' and 'cleaners'.

- *Prediction 6a.* The responsibility manipulation will be more effective in checkers than cleaners.
- *Prediction 6b.* It will be harder to elicit the urge to check compared with the urge to wash/clean especially in the low responsibility condition.

- *Hypothesis 7.* There is a causal relationship between perceived responsibility for threat and the experience of anxious cognitions and fear sensations.
- *Prediction 7.* There will be more fear cognitions and body sensations in the high responsibility condition (subject alone) than in the low responsibility condition (subject + experimenter).

5.7.4. Method

Subjects

Forty-six subjects who participated in the earlier experiments agreed to attend the Institute of Psychiatry to participate in this one. Five subjects were used to pilot the design of the present experiment. One subject could not think of any behavioural task that was suitable for the IoP and was not included in the analyses. Therefore forty subjects were included in the analyses. The subjects all fulfilled DSM - III- R criteria for obsessive compulsive disorder. The mean age of the subjects was 35.78 years (sd=9.97; range 23-70 years) and 24 (60%) were female.

The Responsibility Manipulation

Perceived responsibility for a feared outcome was manipulated naturally by conducting

exposure in vivo with response prevention in two different conditions

- high responsibility - the subject is alone
- low responsibility - the subject is with the experimenter.

Procedure

This experiment was the last given to all subjects, as it was partially dependent on information concerning obsessional thoughts and compulsions which had been collected throughout the assessment. As in the Lopatka and Rachman (1995) study, the feared stimulus to which the participant would be exposed was negotiated between the experimenter and the subject. The task used for the manipulation was determined by the experimenter and subject in the following way:

Experimenter:

'If it's O.K. with you, I'd like to carry out some behavioural work here today. You mentioned in the interview that your biggest problem is _____*(e.g. checking, washing, mental compulsions)*. I'd like you to _____ *(EXPOSURE: e.g. leave the building, touch the toilet seat, think about death)* without _____ *(RESPONSE PREVENTION: checking the door is closed, washing your hands, thinking a good thought)*. Since this is research and not treatment, I don't want to make you too frightened. Do you think that if you _____ (*e.g. left the building, touched the toilet seat, thought about death)* without _____ (*e.g. checking the door, washing your hands, thinking a good thought*) that you will become anxious? After you have _____ *(e.g. left the building, touched the toilet seat, thought about death)*, I will ask

you a series of questions. After that, you can _____ *(e.g. check the door, wash your hands, think a good thought)* afterwards if you would like to'.

Negotiation took place as to the precise nature of the task that would take place, for example, touching the toilet seat, door or handle.

Subjects were then entered into one of two conditions: high responsibility (exposure + response prevention in the clinic alone), or low responsibility (exposure + response prevention in the clinic with the experimenter). Subjects could not be entered into these two conditions in a counterbalanced manner as the nature of the task sometimes necessitated the experimenter accompanying the participant during the first exposure session to make it clear what the participant should be doing. In cases when this was not necessary, the subjects were entered into the conditions in a way that would promote equally sized groups in both conditions. Twenty-one of the 40 subjects first experienced exposure + response prevention in the presence of the experimenter, while the remaining 19 subjects first experienced 'exposure + response prevention' condition while alone.

Instructions continued as follows:- 'After you have _____ *(e.g. left the building, touched the toilet seat, thought about death)*, what I want you to do is to resist the urge to _____ *(e.g. check the door is closed, wash your hands, think a good thought)* Instead, I want you to think about ____ (FEARED CONSEQUENCE: *e.g. the building being burgled, you being contaminated, death of a relative*) for 5 minutes. [I will now leave the room and return after 5 minutes to ask you some questions]. If you feel as though you cannot last the 5 minutes, please tell me [or come and get me]. Do you understand what I would like you to do?'.

After this 5 minute time period (or before, if the participant was unable to resist his/her

compulsions for this time), the experimenter then asked a series of questions, based on those used by Lopatka and Rachman in their study.

Measures

During exposure with response prevention, a variety of different measures were taken including urge to neutralise, discomfort, responsibility for the intrusive thoughts, probability estimates and estimates of feelings of control. Measures of fear cognitions and body sensations were also taken in order to determine the effects of manipulating responsibility on these, as well as the effect on specific obsessional cognitions.

Questions asked during exposure, before carrying out compulsions.

All participants were asked to answer the following on a scale where 0=`None at all' to `100' meaning extremely high. The first set of questions will be referred to as `OCD' questions, the second set as `bodily sensations' questions and the final set as questions concerning `fear cognitions'. The questions for the first set are based on those from the Lopatka and Rachman study and the questions for the other two sets are based on Chambless's fear cognitions and body sensations questionnaires. See appendix 2 for measures.

In all cases in which the experiment had elicited any discomfort, after the completion of the questions, subjects carried out their compulsions. They were told that the experiment would be repeated but this time the experimenter would (not) be with them.

The experiment was completed with an additional question at the end - did you think that you wanted to go home? This was usually met with a smile and ended the assessment on a good note. Subjects were given information about obsessive-compulsive disorder as a token of our appreciation for having participated in the study and were invited to an annual 'OCD

Support Day' at the Institute of Psychiatry. They were asked whether they would like have their name on the OCD database so that they could be informed about developments in OCD research and be contacted to participate in other research projects. The experimenter's name and telephone number were given to the participants, who were told that they should feel free to call this number if they had any questions about any part of the study.

5.7.5. Results

Missing values for all analyses were replaced with the series mean.

The Responsibility Manipulation

Prediction 1

Analyses were conducted to determine whether responsibility for threat was greater in the high responsibility condition (subject alone) than in the low responsibility condition (subject + experimenter). Responsibility for the perceived threat in the absence of another adult had a mean of 60.36 points out of 100 (summarised as 60.36% from now on) with a standard deviation (sd) of 38.37. In the condition where the experimenter was present, the mean responsibility was 44.54% (sd=35.805). A student's t-test for the difference between dependent means was significant ($t=3.56$, $P<0.01$). These analyses confirmed that the manipulation was successful. It should be noted, however, that the mean difference in perceived responsibility between the two conditions was 15.82% compared with a mean difference of 73.7% in the responsibility manipulation study of Lopatka and Rachman. The mean scores for the obsessional variables within each condition are shown in Table 5.9.

Effect of the Responsibility Manipulation

Predictions 2a,3a,4a, and 5a

The mean scores on the `obsessional' variables are shown for each condition in Table 5.9.

Table 5.9. Descriptive Statistics for Obsessional Variables within each condition

	Condition			
	Subject alone (High Responsibility for threat)		**Subject + Experimenter (Low Responsibility for threat)**	
	Mean	**sd**	**Mean**	**sd**
Responsibility for Threat	61.68	(38)	44.54	(38)
Urge to Neutralise	60.13	(34)	48.78	(35)
Discomfort/Anxiety	46.64	(31)	38.81	(27)
Responsibility for Thoughts	62.97	(41)	62.94	(38)
Likelihood of Threat	34.46	(33)	26.73	(32)
Control over Threat	38.48	(43)	32.62	(39)

A multivariate analysis of variance for repeated measures (MANOVA) was conducted on all measures. This approach is identical to that of Lopatka and Rachman (1985) used for a variety of reasons, including that it controls for type 1 error rates by taking into account that several of the dependent variables may be inter-related. MANOVA allows for differences that may not be revealed in separate analyses of variances and thus it can be a more powerful statistical tool.

Analyses were conducted to determine the effect of the the two conditions of responsibility on the obsessional variables, and the order of the exposure + response prevention, given that subjects were allocated in a non-random way. The within-subject factor was the condition of responsibility (high or low) and the between group factor was the order of presentation (with experimenter first vs alone first). A significant main effect was found for the within-subject factor of the condition of responsibility ($F(6,33)=2.84$, $p<0.025$), but there was no significant effect of order ($F(6,33)=0.904$, $p>0.05$). The significant main effect suggests that there were differences between the two conditions of responsibility. The significant results indicated that it was appropriate to continue to conduct further analyses.

Paired t-Tests were conducted comparing the dependent variables in each of the two conditions. The alpha level was set at $p=0.05$ unless otherwise specified. Compared to the low responsibility condition, subjects in the high responsibility condition :

a) felt a significantly higher urge to perform the compulsion, $t(=2.93)$

b) felt significantly more discomfort/anxiety, $(t=2.16)$

c) felt that the feared consequence was significantly more likely to happen, $(t=2.00)$.

There were no significant differences between the subjects on the following variables: responsibility for their thoughts ($t=0.28$) or control over the threat ($t=1.02$).

Correlational Analyses

Predictions 2b, 3b, 4b and 5b

The correlations between perceived responsibility for threat and the other obsessional variables are shown in Table 5.10 for each condition.

Table 5.10. Pearson Product Moment Correlations between perceived responsibility for threat and other obsessional variables within each condition.

HIGH RESPONSIBILITY CONDITION (Subject Alone)

	Urge to Neutralise	Discomfort /Anxiety	Resp. for Thoughts	Likelihood of threat	Control of threat
RESPONSIb-ILITY FOR THREAT	**.4355****	**.3793***	**.1810**	**.1054**	**.1940**
Urge to Neutralise		.6747**	.4310**	.1854	.1296
Discomfort Anxiety			.3611*	.3302*	-.0447
Responsib-ility for Thoughts				.1995	.2148
Likelihood of Threat					-.0580

LOW RESPONSIBILITY CONDITION (Subject + Experimenter)

	Urge to Neutral-ise	Discomfort /Anxiety	Resp. for Thoughts	Likelihood of threat	Control of threat
RESPONSIB-ILITY FOR THREAT	**.3803***	**.5250****	**.0631**	**.1248**	**.1814**
Urge to Neutralise		.6680**	.2228	.2210	.0385
Discomfort Anxiety			.2803	.2895	.0504
Responsibility for Thoughts				-.0429	-.0054
Likelihood of Threat					-.0913

Effect of type of compulsion

Predictions 6a and 6b

The analyses to test the effect of the responsibility manipulation were repeated dividing subjects according to the type of compulsion elicited in the behavioural test- **checking (n=16) and was**hing (n=10)

The multivariate analysis of variance was conducted. The within-subject factor was the responsibility condition and the between group factor was type of compulsion. **There was no significant main effect for the responsibility condition ($F(6,19)=1.28$, $p>0.05$) or for the type of compulsion ($F(6,19)=1.57$, $p>0.05$). There was no significant interaction between the responsibility condition and the type of compulsion ($F(6,19)=0.68$, $p>0.05$).**

The results comparing the different types of

compulsions are shown in Table 5.11.

5.11 Effect of the Responsibility Manipulation on Different Compulsions

Variable	**Subject Alone (High Responsibility for Threat)**				**Subject + Experimenter (Low Responsibility for Threat)**			
Group Means and Standard Deviation	Check-ers (n=16)	Wash-ers (n=10)	Mental rituals (n=8)	Symme-try (n=4)	Check-ers (n=12)	Wash-ers (n=10)	Mental rituals	Sym-metry
Resp. for threat	52.83 (39)	74.5 (33)	64.87 (36)	76.25 (38)	37.76 (34)	64.41 (34)	46.69 (36)	40.00 (40)
Urge to neutralise	47.50 (34)	80.50 (29)	56.25 (29)	65.00 (41)	40.55 (33)	68.76 (22)	40.00 (36)	61.25 (39)
Discomfort/ Anxiety	37.12 (26)	71.00 (30)	40.0 (28)	47.5 (34)	33.11 (26)	52.76 (23)	36.88 (26)	42.50 (31)
Resp. for thoughts	52.07 (43)	75.00 (35)	50.0 (44)	70.00 (36)	53.86 (39)	72.59 (24)	65.00 (35)	52 .5 (41)
Likelihood of threat	20.31 (23)	44.00 (41)	24.88 (29)	67.5 (39)	14.67 (14)	38.85 (32)	10.13 (14)	71.25 (45)
Control over threat	30.94 (43)	29.00 (41)	54.3 (47)	17.5 (35)	28.3 (40)	37.02 (33)	50.88 (41)	0.00 (0)

The urge to clean was significantly higher than the urge to check both when the experimenter was present ($t=2.36$, $p<0.05$) and she was absent ($t=2.52$, $p<0.05$).

Effect on Fear Cognitions and Bodily Sensations

Prediction 7

Bodily Sensations

There was no significant difference between the number of bodily sensations experienced in the low and high responsibility conditions (mean=3.7 in low responsibility condition, mean=3.8 in high responsibility condition; t=0.31). The strength of the endorsements in both conditions was computed as the sum of the strength of the endorsements of individual items. A t-test revealed no significant differences between the strength of endorsement in the two conditions (t=-1.16).

Fear Cognitions

There were no significant differences between the number of fear cognitions experienced in the low and high responsibility conditions (means=1.03 and 1.08 respectively). The strength of the cognitions was computed as the sum of the strengths of the endorsements of the individual items. A paired t-test showed no significant differences between the strength of endorsements the two conditions (t=-0.3, $p<0.05$).

Summary of Results

Prediction 1. This was fulfilled. Perceived responsibility for threat was higher when a subject conducted exposure in vivo with response prevention alone, than when a subject conducted exposure in vivo with response prevention in the presence of an experimenter. This provides support for the hypothesis *that perceived responsibility for threat will vary*

according to the presence/absence of an experimenter.

Prediction 2a and 2b. These were fulfilled: the urge to perform compulsive neutralising behaviours was higher when undergoing exposure with response prevention in the high responsibility condition (subject alone) than in the low responsibility condition (subject + experimenter); there was a significant positive correlation between estimates of perceived responsibility for threat and the urge to perform compulsive 'neutralising' behaviours. This provides support for hypothesis 2 that *There is a causal relationship between perceived responsibility for threat and the urge to perform compulsive 'neutralising' behaviours.*

Prediction 3. Predictions 3a and 3b were fulfilled: discomfort/anxiety was higher when undergoing exposure with response prevention in the high responsibility condition (subject alone) than in the low responsibility condition (subject + experimenter); there was a significant positive correlation between estimates of perceived responsibility for threat and discomfort/anxiety. This provides support for hypothesis 3 `that` *there is a causal relationship between perceived responsibility for threat and discomfort/anxiety.*

Prediction 4. This was not fulfilled. Perceived responsibility for thoughts was no different when undergoing exposure with response prevention in the high responsibility condition (subject alone) than in the low responsibility condition (subject + experimenter); there was no significant positive correlation between estimates of perceived responsibility for threat and perceived responsibility for thoughts. There was no support for the hypothesis that *there is a causal relationship between perceived responsibility for threat and perceived responsibility for thoughts.*

Prediction 5. This prediction was fulfilled: estimations of the probability of threat were higher in the high responsibility condition (subject alone) than in the low responsibility condition (subject + experimenter) but the estimations of the controllability of threat in the high responsibility condition (subject alone) did not differ from those in the low responsibility condition (subject + experimenter); there was a significant positive association between responsibility for threat and estimates of the probability of threat, but not between responsibility for threat and estimates of the controllability of threat. This provides support for the hypothesis that *estimations of the probability of threat are dependent upon perceived responsibility for threat; estimates of the controllability of threat are not.*

Prediction 6. This prediction was partially fulfilled. The elicited urge to check was significantly lower than the elicited urge to clean (i.e. it was harder to elicit the urge to check than the urge to clean), particularly in the low responsibility condition. However there was no significant interaction between the responsibility condition and the type of compulsion. Therefore there was some support for the hypothesis *that perceived responsibility plays a greater role in checking compulsions than cleaning compulsions.*

Prediction 7. This was not fulfilled. There were no significant differences in the number of fear cognitions and bodily sensations experienced between the two conditions. The results did not support the hypothesis that there is a causal relationship between perceived responsibility for threat and the experience of anxious cognitions and fear sensations.

5.7.6. Discussion

The primary aim of this study was to investigate the effect of manipulating responsibility on obsessional cognitions, and also on anxious cognitions and fear sensations. The responsibility manipulation was successful in that perceived responsibility for threat was higher when the subject was alone than when the experimenter was present. This supports the observation that the presence of the experimenter or clinician leads to a lack of the normal obsessive-compulsive response in OCD patients, particularly those with checking compulsions (Rachman and Hodgson, 1980). However, the manipulation of responsibility was indirect, and the resulting levels were low compared to the Lopatka and Rachman (1995) manipulation.

The results provide some support for the hypothesis that obsessive-compulsive phenomena are a function of perceived responsibility for threat, since in a condition of high responsibility the urge to 'neutralise', discomfort/anxiety and estimations of the probability of threat were all higher than in the low responsibility condition. The relationship between high responsibility and the urge to neutralise is directly in keeping with the definition of 'neutralising' as 'voluntarily initiated activity which is intended to have the effect of reducing the perceived responsibility' (Salkovskis, 1995). It follows from this that the greater the responsibility, the greater the need to reduce it by neutralising. Similarly, it is easy to understand the relationship between an increase in anxiety and an increase in perceived responsibility for threat. If a person felt as though he/she were personally responsible for causing a burglary, for example, by leaving a window open, the thought of the burglary may cause more anxiety and discomfort than if a person felt as though a burglary was inevitable. However, it is possible that it is not the increase in the perceived responsibility for threat that gives rise to elevated anxiety, but rather the increase in the estimation of the probability of threat.

The finding that a person perceives a threat to be more likely to happen in the high than the low responsibility condition is interesting for a number of reasons. Firstly, the finding ties in with Carr's (1974) and subsequent observations that people with OCD overestimate the probability of danger. On the other hand, Salkovskis (1985) suggested that it is not estimation of risk per se that is important in OCD, but the appraisal of intrusions as being responsible for harm. The results from the study indicate that these phenomena may interact. It may be that it is the appraisal of intrusions as being responsible for harm that leads to an increase in the estimation of risk. Given the direction of the manipulation (i.e., perceived responsibility was manipulated, resulting in an increase in the estimation of risk), this explanation is more plausible than the possibility that an estimation of risk leads to one feeling responsible for the negative outcome. The role of thought-action fusion in this appraisal process, and the relationship between thought-action fusion and responsibility may be fruitful areas for further research (see chapter 6).

However, unlike in the Lopatka study, there was no association between likelihood of threat and responsibility for threat. This may be explained by the actual levels of perceived responsibility. In the high responsibility condition, the responsibility for perceived threat was still only 62 points compared to the mean responsibility level of 90 points in the experimental manipulation of the Vancouver group. This particular manipulation of responsibility was less effective than that of Loptaka and Rachman (1995), but this was only to be expected as the manipulation was indirect as opposed to direct.

As in the study of Lopatka and Rachman (1995), no relationship was found between estimates of control and perceived responsibility. The relationship between

control and responsibility is complex and for reasons of space cannot be examined in detail here. However, according to logic (but not feelings), although control can exist without responsibility, responsibility cannot exist without an element of control. Therefore, if a person has no control over an event, he/she cannot be held responsible for it. Similarly, if a person has much control over an event, according to logic, the responsibility of that person increases. One explanation for the lack of relationship between perceived responsibility for threat and control over it is that people with OCD may be assuming excessive control over all negative events, whether or not they can influence them. Therefore even in a low responsibility situation, subjects perceive control. In support of this possibility is the work on the fusion of thoughts and actions in which some people with OCD perceive themselves able to influence real world events by their thoughts.

There was also no difference between the high and low responsibility conditions in the perceived responsibility for thoughts. Although the perceived responsibility for threat and thoughts were similar in the high responsibility conditions, the presence of the experimenter did not decrease perceived responsibility for thoughts in the same way that it reduced the perceived responsibility for threat. On my asking the question about how responsible the subjects felt for their thoughts, many looked at me as though I were mad! The presence of another person may reduce the perceived responsibility for threat because another person can take action to prevent the threat, such as making sure the door is locked, but seemingly cannot alter the perceived responsibility for thoughts. This makes intuitive sense.

The differences between people with checking and cleaning compulsions were interesting. The presence of the experimenter did reduce the responsibility for threat in 'checkers' more than 'cleaners'. It may be that responsibility is less important for people

concerned with contaminating themselves, who fear that they themselves will become ill through contaminants, than for cleaners who fear contaminating others and being responsible for someone else becoming ill. Unfortunately in this study, the numbers were too small to allow for refined analysis of that nature, but future studies designed to specifically assess responsibility in people with cleaning compulsions would be valuable.

Fear cognitions and body sensations experienced did not change between conditions of high and low responsibility. Since fear cognitions and body sensations are responsive to changes in anxiety, this finding provides some support for the suggestion that, although both anxiety and responsibility are different between the two conditions, what is crucial in determining the obsessional variables is the level of responsibility. The finding supports the assertion that the effect of responsibility on obsessionality is fairly specific, and does not work through the more general mechanism of anxiety.

Further work is needed in this area. The differential role of responsibility according to the types of compulsions - people who check, clean and other obsessional phenomenological groups - would prove a fruitful area to explore. Similarly, the relationship between cognitive biases, responsibility and thought-action fusion warrants further investigations. Studies investigating thought-action fusion can be found in chapter 6.

5.7.7. Summary

Perceived responsibility for threat was manipulated by varying the presence/absence of an experimenter. In the high responsibility condition (subject alone), the urge to neutralise, discomfort/anxiety and estimates of the probability of threat were all higher than in the low responsibility condition (subject + experimenter). Responsibility for

thoughts and perceived control over the threat remained unchanged in the different conditions. There were significant associations between the level of perceived responsibility for threat and (i) the urge to neutralise, and (ii) discomfort/anxiety. No significant positive correlations were found between perceived responsibility for threat and (i) estimates of the likelihood of threat, (ii) perceived control over the threat and (iii) responsibility for thoughts. The responsibility manipulation interacted significantly with the type of compulsion elicited; the presence of the experimenter did not reduce perceived responsibility for threat in the cleaners as much as for checkers. Fear cognitions and bodily sensations did not change significantly between conditions, indicating that the effects on obsessional variables of the manipulation of responsibility are fairly specific and are unlikely to work solely through anxiety mechanisms.

5.8. General Discussion

The aim of the three studies was to test the cognitive-behavioural model of OCD and elucidate the role of perceived responsibility in obsessional complaints. The crux of the cognitive-behavioural hypothesis is that intrusive cognitions are interpreted in such a manner that the patients perceives themselves to be potentially responsible for harm to themselves or others unless they take action to prevent it. The first study did not provide support for the suggestion that obsessional complaints are associated with perceived responsibility <u>in general.</u> This does not undermine the model, since perceived 'responsibility for harm' has consistently been the only domain which has been considered to be important in the model. However, the model would predict the subscale 'responsibility for harm' to be associated with obsessional complaints, and for the high MOCI scorers to show more perceived responsibility for harm than low MOCI scorers.

The final study showed that changes in perceived responsibility for threat resulted in changes in the urge to neutralise, discomfort/anxiety and estimates of the probability of harm. This was particularly true of people with checking compulsions, and directly supports the assertion that the purpose of neutralising is to reduce perceived responsibility (Salkovskis, 1995). The second study indicated that there was a specific association between pathological responsibility and obsessional variables.

Overall, these studies can be considered to have tested and elucidated the role of responsibility in obsessional complaints. In the latter two studies, it appeared as though perceived responsibility was more important in checking compulsions than washing compulsions.

The major findings of the present studies have important implications, both for future research into OCD and for clinical practice. There is no good measure of responsibility appraisal, despite the development of a series of questionnaires, some more successful than others (Gledhill, 1992; Rhéaume et al., 1995; Rachman et al., 1995). A new measure is currently under development in Oxford (Salkovskis, Wroe et al., 1995). This measure is specific and is designed to assess interpretation of, and reaction to, intrusive thoughts. In particular, interpretations of cognitions in terms of responsibility for harm is assessed, for example 'I could be responsible for harm', 'It would be irresponsible to ignore these thoughts'. Interpretation of cognitions in terms of emotions is also assessed, e.g. 'I'll feel awful unless I do something about this thought'. Questions also relate to TAF and the relationship between thoughts and actions in the real world e.g. 'Thinking this could make it happen'. Subjects are asked to rate how often they interpret their thoughts in terms of responsibility for harm, and their belief in this interpretation.

This questionnaire is much more closely related to the cognitive-behavioural model

than the RAQ. The questionnaire is specific and free of obsessional content, since it is up to subjects write down their own intrusions. However, it is also important to find a balance between testing theoretical assumptions of the model, and merely describing the phenomenon.

The results indicate that the model may be more closely applicable to compulsive checking than compulsive cleaning behaviours. This has important implications, and stands in need of explanation. It is clear tha,t in some patients with contamination fears, responsibility for passing contaminants onwards is an important feature of the disorder. Yet, in others, the disorder appears to be closely related to phobias (see Hodgson and Rachman, 1980). Further studies are needed with larger samples to determine whether this finding is robust. If it is, a number of theoretical predictions arise:-

- cleaners/washers with low perceived responsibility for threat will be more concerned about contaminating themselves than others.
- cleaners/washers with high perceived responsibility for threat will be concerned about contaminating others as well as themselves.
- cleaners/washers with high perceived responsibility for threat are more likely to have checking compulsions than those with low perceived responsibility for threat.

If perceived responsibility differs between those with washing and checking compulsions, it follows from the third study that guilt, depression and anxiety may also differ. It may be that washers experience more of an anxious/depressive guilt, perhaps for failing to live up to one's own moral (and other) standards; on the other hand, the guilt that characterises checkers may result from perceived responsibility for a negative event. Although clearly related to each other, guilt that results from perceived responsibility for a

negative event may differ in the following ways from depressive guilt (Berrios et al., 1992):-

Guilt resulting from Perceived Responsibility for a negative event	**Depressive Guilt**
Restorative Action possible	No possible restorative action
Specific (relating to event)	General (relating to person)
Triggered by intrusion	No identifiable trigger
Concrete punishment imminent	No specific punishment
More 'cognitive'	More 'mood/feeling'

It is suggested that the relationship between perceived responsibility for threat and its emotional sequelae should be explored in future studies.

Clinically, the studies have important implications for treatment. The presence of another person appears to reduce perceived responsibility for the threat in people with checking compulsions. Therefore, in a graded hierarchy of exposure in vivo with response prevention, the presence of the experimenter should be considered. It may be that exposure exercises in the clinic should be undertaken with the expe rimenter absent in order to elicit the urge to neutralise and expose the patient to the feared stimuli. Issues of perceived responsibility for threat should be addressed in therapy, particularly for checkers and perhaps those with fears of contaminating other people. Finally, the studies have identified a cognitive bias which has clinical implications and is potentially of importance to our conceptual understanding of the disorder. This bias of TAF warrants further investigation in order to determine its prevalence amongst patients with OCD, and the

normal population. The effects of the bias on obsessional symptoms is also of interest and future studies should aim to elucidate the effects of manipulating TAF on obsessional complaints.

5.9. Summary

Three studies were conducted to explore the nature of perceived responsibility and its relationship to obsessional complaints. The conclusion from the first study was that, if responsibility is important in obsessional complaints, it is a specific type of responsibility, and that the data did not support the importance of the broad concept of responsibility in obsessional complaints. One of the subscales of responsibility, thought-action fusion (TAF), was found to be related to obsessional complaints in a reliable manner, and future work in the area of TAF was suggested. The second study manipulated perceived responsibility for threat by varying the presence/absence of the experimenter. This manipulation was successful, and subjects had a significantly greater urges to neutralise, discomfort/anxiety and estimates of the probability of harm in the high than the low responsibility condition. Controllability of threat and perceived responsibility for thoughts did not vary between conditions. The responsibility manipulation was more successful in people with checking compulsions than those with cleaning compulsions, since the presence of another person did not appear to reduce the perceived responsibility for threat in this latter group. The final study used a measure of pathological responsibility, and there was evidence of a significant, specific relationship between this measure and checking behaviours. There was also a significant association between guilt and pathological responsibility.

In sum, these three studies have served to test and develop the cognitive-

behavioural model of OCD. The studies also indicated that the cognitive bias of TAF would be a fruitful area for future research. The next study therefore was designed to explore the nature of thought-action fusion in an obsessional population.

CHAPTER 6

Thought Action Fusion

"I also have the fear that my thoughts may harm someone" (CM).

6.1. Introduction

In the psychometric study to design a general measure of responsibility, one of the most interesting findings was that the subscale of Thought Action Fusion (TAF) was highly reliable and strongly associated with obsessionality. In this chapter, the concept of TAF is explored. TAF is considered within the cognitive-behavioural (C-B) model of OCD and the relationship between TAF and perceived responsibility, anxiety and guilt is outlined. A large psychometric investigation of TAF is reported, and the findings considered within the theoretical framework of the C-B model. Two case studies of people with TAF are given to illustrate this phenomenon in an obsessional population. The chapter concludes by discussing future research that could be done to examine the importance of TAF in OCD.

6.2. Thought Action Fusion: The concept

At first glance, it appears strange that an intrusive thought (e.g., about harm coming to a loved one) can prompt a series of apparently unrelated behaviours, such as touching a specific object three times, or carrying out another ritual. However, this phenomenon is not restricted to an obsessional population, since early results indicate that physical action can neutralise intrusive thoughts.

The broad question about the relationship between internal and external events will not be discussed at length. Rather the specific connection between unwanted intrusive thoughts and how they relate to the real world is the topic under investigation. One of the propositions set out by Salkovskis (1985) in his exposition of the C-B model of OCD was that some patients may have the dysfunctional assumption that 'a thought is like an action' (Salkovskis, 1985, p.574). This dysfunctional assumption is rather broad and a number of possibilities remained open. It is possible that people with OCD:

1 do not discriminate between thoughts and actions at all e.g. if I think of harming a child, I actually harmed a child.

2 evaluate the occurrence and content of thoughts and actions in the same way, e.g. if I think about harming a child, this is as bad as actually harming a child.

3 retrospectively confuse thoughts and actions e.g. did I really harm a child or did I only think about harming a child?

4 believe that there is an <u>indirect</u> association between thoughts and actions e.g. if I think about harming a child, this makes it more likely that I will harm a child.

5 believe that there is a <u>direct</u> association between thoughts and actions e.g. believe that thoughts mean they should carry out an action directly, as in patients with schizophrenia who hear voices telling them to 'kill' e.g. if I think about harming a child, I should harm a child.

The clinical phenomena and research evidence exclude the first and last options from being the sort of fusion between thoughts and actions that characterise this disorder

(Rachman, 1993; Bolton, 1995). The retrospective fusion between thoughts and actions is apparent in the doubting that plagues people with OCD (Rasmussen and Eisen, 1991) and it would be confusing to term this phenomenon 'TAF' as opposed to doubting. Therefore, Rachman (1993) defined two types of TAF.

The first type of TAF will be termed 'moral' TAF and is defined as:-

The psychological phenomenon in which unacceptable thoughts and forbidden actions are interpreted as morally equivalent. The person feels that his or her unacceptable thoughts, images or impulses are (almost) as bad as the event. For example, if a carer experiences the unwanted thought that she is going to stab an elderly patient in her care, she is likely to feel (almost) as morally reprehensible as if she had harmed the elderly patient in reality.

The second type of TAF will be termed 'likelihood' TAF and is defined as:-

the belief that thinking about an unacceptable or disturbing event makes it more likely to happen in reality. For example, if a husband experiences the intrusive thought of his wife being in a car accident, he is likely to feel that his wife is at greater risk of having a car accident, <u>because</u> he has had the thought.

6.3. TAF and the cognitive-behavioural model of OCD

The C-B model of OCD emphasizes the role of anxiety, guilt and perceived responsibility for threat (see chapter 2). It was recently hypothesised that the psychological fusion of thoughts and actions may be a common factor in obsessions, responsibility and guilt (Rachman, 1993), serving to inflate the significance of intrusive thoughts. The relationship between TAF and anxiety is open to speculation, but it is not difficult to see how a person

who believes in the 'likelihood' type of TAF in particular will become anxious when an intrusive thought occurs. Having TAF imbues the thought with anxiety-provoking qualities which in turn makes the intrusions harder to dismiss, more frequent etc. (Butler et al., 1995). The moral TAF may be more closely related to depression than anxiety. Since depression is closely related to OCD and anxiety (Karno et al., 1988), it may be that the moral TAF also gives rise to anxiety. Alternatively, being anxious may increase TAF, since people may believe that they would not feel such a high level of anxiety on the occurrence of the significant thought, unless they were causing the action in some way by their cognitions. Similarly, a high level of anxiety may be interpreted as evidence that the person is 'bad' for having had the unwanted thought and is (almost) as bad as he/she would be if the action had been carried out.

The relationship between TAF and guilt may be similar to that of anxiety. Both types of TAF could lead a person to feelextremely guilty. A belief in the 'likelihood' TAF would lead to feelings of guilt owing to the potential for harming a loved one. This is closely associated with a perception of responsibility. A belief in the 'moral' TAF would almost directly raise levels of guilt on the occurrence of an intrusive thought. As with anxiety, the process may be two-way, as high levels of guilt could lead to the belief 'I must be bad' since the person may seek an explanation as to why he/she is experiencing such high levels of guilt. If the person perceives that guilt levels could not be any higher if the action had been carried out, this may increase any moral TAF that may be present. Similarly, feeling very guilty could lead to the assumption that the person in some way increased the chances of the event happening by his/her intrusive thoughts. It is probable that feelings of guilt will be directly

associated with feeling of perceived responsibility, as discussed in chapter 5.

TAF can be seen most clearly within the C-B model when considering the association between TAF and responsibility. Salkovskis suggests that the link between the occurrence of a cognitive intrusion and the need for action is the misinterpretation of the cognition that the person may be responsible for harm unless action is taken to prevent it. TAF, in particular the likelihood type, may be a fundamental part of the catastrophic misinterpretation 'I am responsible for harm'. Salkovskis (1985) specified that the misinterpretation involves 'an inflated belief in the probability of being the cause of serious harm to others or self' (p.575. original emphasis). A person is liable to believe that he/she has contributed to being the cause of the negative event, if he/she believes that the probability of a negative event is increased by thinking about it. A strong belief in TAF may even lead a person to believe that he/she has pivotal responsibility for the negative outcome (Rhéaume et al. 1995). Having assumed (some) responsibility for potentially causing a negative event, the person may assume (some) responsibility for preventing that negative event from occurring, particularly when the event may be the death of a loved one. The steps that a person may take to prevent the negative event from occurring may be to remove the power of the intrusive thought by internal neutralising, such as repeating an intrusive thought with 'DOES NOT' a certain number of times after the intrusive thought, 'I hope my mother dies'. Thus some examples of mental neutralising can be seen as a reverse form of TAF: the person attempts to influence real world events by effortfully changing his/her cognitions. Checking behaviours may be a form of external neutralising which could arise from TAF. If a person experienced the intrusive thought that the gas was on, and believed that thinking about this may have increased the

chance of the gas being left on, checking that the gas is off is a means by which the effects of the cognition may be counteracted.

6.4. TAF and the Heterogeneity Hypothesis

The C-B model predicts that TAF is associated with obsessionality, whereas the 'basal ganglia deficit' model does not necessarily predict an association between TAF and obsessionality. Another difference between these models is that TAF would be considered to be on a continuum with normal behaviour. That is, TAF would be predicted to occur in the normal population, although to a lesser extent than in an obsessional sample. However, the basal ganglia deficit model assumes that 'deficits' are abnormal and do not occur unless a biological system is not functioning correctly.

6.5. Case Illustrations of TAF

Tallis (1994) has described two cases who experienced TAF, obsessions, 'responsibility' and guilt. These two cases reported having simultaneously experienced a negative event and an unwanted intrusive thought. After the occurrence of the event, the person interpreted subsequent occurrences of her intrusions as signalling the possibility of future disaster unless action was taken to prevent it. The subject:-

'Had enormous difficulty distinguishing thought from action. For example, she would become extremely distressed after preparing meals for the elderly, thinking that she may have unwittingly mixed a poisonous substance into their food. These thoughts were particularly troublesome when the S was given more responsibility than usual, for example when taking

her wards on an outing. Exploration of the origins of this characteristic revealed a critical learning incident. As a child she had been continually sexually abused by her father. When she was 15 years of age, she recalled forming an intense wish that he would 'go' or be 'taken away', and prayed to this effect. Within a week, her father was involved in a rail 'accident'. He was instantly killed. There was some suspicion of suicide. Thereafter, the S experienced extreme guilt and self-blame. This guilt was so unbearable that she reported wanting to die.

In later life, she experienced several occasions when she thought about 'disasters' which were subsequently reported in the media. Although she did not feel that she was the cause of these disasters, they served to reinforce her belief that mental events and events in the real world bore a close relationship to each other' (Tallis, 1994).

In this study, two people had TAF and consented to an informal interview about their beliefs concerning thoughts and actions. These two cases are described below:-

Case 1

KP is a caucasian married woman who volunteered to participate in our research project into OCD. She is in her mid-thirties, married with no children. She has never sought help for her difficulties. She openly stated that when she has a bad thought about her parents dying, she feels as though she has to perform a ritual (usually touching things or going over things in a certain way) in order to stop the bad thing happening. If she does not do this, she said that she would feel responsible if something bad happened to her parents, and that she does the rituals so that, if something bad did happen to her family, it would not be her fault.

During the exposure exercise, KP expressed her belief that thinking about a bad event,

such as her parents dying, could increase the chance of the event happening. She consented to go into further detail.

She expressed the belief that there was something inside her which she and her sister had termed the 'devil'. This devil was part of her. The bad thought about her parents' deaths would come into her head and immediately trigger off this 'devil', whose powers could extend and influence the event and make the car crash. She did not truly believe in the presence of the 'devil', and I suggested the word 'vibe' may be more appropriate than devil and she agreed. She said that it was as though the thought triggered off a vibe, and it was the vibe that had an effect on the real world and could somehow make the car crash.

From her talking, I had the picture in my mind that this vibe was like a beam radiating from her. When I asked if this was the case, she said that it was sometimes like this, but that it wasn't always the case that the thought would trigger the 'vibe' or devil and the devil would work its influence. This only happened when she was thinking about something like her parents having a crash on their forthcoming journey. Sometimes the thought would just come that she had to touch something to stop something bad from happening, and in that way she could act to stop the devil, although she did not have anything to do with setting the devil off.

By this time, she was a little confused, and said that,with some thoughts that she had, she could influence things by triggering off the devil and thus she could affect real world events by means of her thoughts. However, sometimes she could only act to stop the vibe/devil. She said that performing the ritual served to postpone the devil, but that she could never banish it completely. Sometimes doing something once would not be enough to postpone the vibe, but she would have to do it over and over before it could be broken.

I asked about the limits and the power of this devil/vibe and whether or not it could make good things happen. She said that it could, for example, .. make her confident, but she was uncertain as to whether that was her or the power of the vibe/devil. She said that if she had good thoughts,t hen that could make her confidentwhich would send out signals to the world and make the day go well. It was more often,t hough, that she could stop the bad thing happening by intercepting the vibe/devil and carrying out the ritual to break its power. Throughout the interview she maintained that she knew rationally that she did not have this power and it made her feel guilty to talk in this way, as it almost sounded 'egocentric'.

I asked whether there was a specific incident whereby something she had thought in the past had coincided with something happening to someone in reality. She recalled being told to rub the stomach of a Buddha which was in her parents' home, and making a wish. She wished to pass her 11+ examination and she did. She also recalls rubbing the stomach and wishing that her father, who was an alcoholic, would not drink. Her father continued to abuse alcohol despite the wish. However, this was discounted by KP, who said that it was as though her father still drank because of some ritual that she had failed to perform properly.

KP recalled that she had thought as a child that something she did or did not do might have an influence on her father's drinking. She was uncertain as to whether her rituals had any effect in reality. She said that, when something bad did happen, such as her brother-in-law having cancer, she did not feel responsible for the event but did feel as though her actions could affect the outcome of treatment. Hence she performed rituals in order that his test results may be clear, and they were. She said that she knew rationally that this was ridiculous as she did not have that sort of power to make things happen, but she still felt as though she

had some influence.

Case 2

CM is a 42 caucasian married woman with one daughter. Initially she was extremely anxious during the interview but gradually relaxed throughout the assessment. She has received in-patient psychiatric treatment for her obsessional difficulties but is not currently taking medication.

During the assessment she spontaneously talked about having to follow a positive thoughtby a negative thought in case she was tempting fate. She also said that thinking about something did increase the chance of its happening. When asked to explain a little more about this, she said that it was 'safer' to say something negative becaus,e if she said something positive, then it would not come true as a punishment for her wishing it. If she wished something, then this could affect 'Fate'. She was uncertain of the role of God in fate, saying that she did not believe in God, but did not rule out the possibility that He controls fate.

Examples of C. M. influencing fate were given. If C.M. had not turned up for the interview, then I may have gone somewhere and been hit by a car. It was not the case that she thought the reverse, in that her arriving had had a good effect and prevented me from having an accident. She reported that she did not know the outcome of things, so she never knew whether she had stopped something bad, but she felt as though she could be instrumental in bringing about a bad event.

Fate was described as a chain reaction in which you do something and that has a knock-on effect in many other places. If CM made a suggestion, then that suggestion could

alter fate and have a bad outcome. She said that she did not want to make suggestions, so if something bad happened, she would not have any responsibility for it. She had had a stillborn baby and although she rationally knows that she was not responsible for this, she still feels 'If only'. Rumination about chains of events was a major feature of CM's obsessional complaint.

Fate could be influenced by bargaining with God. Fate/God was described as a supernatural force, and she spoke of the 'Established Law of the Universe'. For example, if a library book had been contaminated in some way by CM and then returned to the library, the person reading the book afterwards might die because of the contamination. As a punishment to CM for returning the book (without consideration for the person who may die), her family would be struck down and killed. Thus she would be directly responsible for a stranger's death and her family would be killed as a punishment. When asked to explain this, CM said that it was just the way that it was, as though it were a Law of the Universe. This law dictated that something bad would happen on the 13th day of the month, and that something bad would happen if she did not touch wood and carry out her compulsions.

Similarly, CM had the idea that, if she did something for herself as part of an exposure + response prevention programme (for example try on clothes in a shop), and accidentally contaminated the clothes, then God would punish her. It was as though, by trying to get well by doing exposure exercises, she would hurt other people and God would therefore intervene and something bad would happen to the person trying on clothes and also to a member of CM's family. It was assumed that by doing anything for herself, she would cause harm to others.

Other examples were more directly religious in orientation. If CM swore something

on someone's life and broke the oath, then there would be divine retribution which would kill the person whose life she swore on. If she swore on the life of someone who was not a family member, she would be more anxious about breaking it, because they would die and CM's family would be killed as punishment. The theme of punishment featured a lot in the interview. CM reported that she felt as though at times 'the whole universe is pitted against me', and that she suffered from 'the ultimate paranoia'.

When asked whether anything in the past had happened when she altered the outcome of things, CM talked about the death of her mother. She said that she had been due to visit her mother on the weekend of her death, but had cancelled because she was having obsessional difficulties. That weekend, her mother went out for a walk with her sister and her brother in-law and her mother was killed. CM considers her mother's death her fault because, if she had gone to see her that weekend as planned, her mother would not have gone for a walk, as CM would have been about to catch the train home at that time. She also mentioned that, in her childhood, CM's sister had said 'I wish you were dead' and CM had retorted 'I could kill you'. CM was reprimanded by her mother, who told her that what she had said was worse than that which her sister had said.

If CM said anything positive, she would always be compelled to say something negative to avoid the punishment of the good thing not happening. If she said anything negative, then this does not have any effect most of the time. God/fate could be bargained with. Although CM recognised the 'punishment' and bargaining to be irrational, she maintained that it was reasonable that fate could be influenced and the course of events changed by both her actions and her thoughts.

6.5.1. Comment

Both these cases illustrate the phenomenon of 'Thought-Action Fusion'. In both cases, thoughts could be discriminated from thoughts and actions in that having a thought could influence an event, but thoughts and events were not indistinguishable. The occurrence and content of the thoughts and actions were evaluated in the same way, and both cases reported believing that there was an indirect association between thoughts and actions either through the 'devil/vibes' or 'God/The Established Law of the Universe'. Neither case believed that there was a direct association between thoughts and actions, as in patients who suffer from schizophrenia. There is some data to support the suggestion that a sub-set of people with OCD have over-valued ideas and schizophrenia-like delusions (Eisen and Rasmussen, 1993; Stanley et al., 1990; Lewis et al., 1991; Tallis and Shafran, 1995). Recent data also suggest a common information processing deficit (Beech and Enright, 1994; Peters et al., 1994). However, the incidence of schizophrenia in people with OCD is no higher than that expected for the general population (Rachman and Hodgson, 1980) and a recent review concluded that `the rates of schizophrenia among those with OCD do not indicate a special association of these disorders' (Kozak and Foa, 1994, p. 347). In the cases described, there was insight into the the beliefs, albeit fluctuating. This is consistent with the view that the beliefs are typical of OCD, as opposed to being the fixed delusions that characterise schizophrenia.

6.6. A study of Thought Action Fusion

In addition to describing cases, empirical research was conducted into TAF. This work was carried out in conjunction with Jack Rachman and Dana Thordarson. I was

involved in data collection and analysis for the obsessional sample, and in writing up the results of the study for publication (Rachman, Shafran and Thordarson, 1995). Jack Rachman led the research team and designed the questionnaire; Dana Thordarson was involved in data collection for the student population, and in data analysis and writing up the results for publication.

6.6.1. Background

It has been argued that some patients with OCD experience TAF in which intrusive thoughts are interpreted as having special significance. TAF is suggested to be a phenomenon which occurs in the normal population, and is related to obsessions, responsibility and guilt (Rachman, 1993). Two case studies have been reported which support the construct of TAF (Tallis, 1993).

An earlier psychometric study in students had used four questions to form a TAF subscale within a responsibility appraisal questionnaire (Rachman et al. 1995). The following conclusions were made with respect to TAF:-

1 The TAF subscale was reliable

2 A minority of a normal population believed in both the likelihood and moral type of TAF.

3 Subjects would endorse one TAF statement, but not the others. Therefore TAF was specific to the content of the statment and was not a general bias applied to all situations.

4 Fewer than half the participants disagreed with any of the statements.

5 TAF was strongly associated with obsessionality (Rachman et al. 1995).

The encouraging results of that study led to a need to develop a full TAF questionnaire, separating out the different types of TAF, and TAF for different types of thoughts. The previous subscale of four items had only included one addressing the moral TAF ('For me, having a mean thought is as bad as doing something mean'); two had addressed the likelihood TAF ('If I have a thought about something happening to an acquaintance, it may bring them bad luck'; 'My mean thoughts wishing a person harm can increase the chance of something harmful happening to him/her'). The fourth question was a mixture of both types of TAF ('My mean thoughts can have the same consequences as my mean actions'). A new, fuller measure of TAF was needed to address the question of whether this phenomenon occurred in the normal population, whether it occurred more in the obsessional population, and to explore the relationship between types of TAF and obsessionality.

6.6.2. Aims

The aims of the study were

1. To develop a refined and reliable measure of TAF.
2. To compare TAF in obsessional and non-clinical samples.
3. To explore the relationship between TAF and measures of obsessionality.

6.6.3. Hypotheses and Predictions

Hypothesis 1

In obsessional subjects TAF occurs at one end of a continuum of TAF.

Prediction 1a

The factor structure of the TAF questionnaire will be similar across both a normal and obsessional population.

Prediction 1b

Thought-action fusion occurs more often in an obsessional population than in the normal population.

Hypothesis 2

TAF is related to obsessionality

Prediction 2

There will be a positive correlation between TAF and measures of obsessionality in the normal and in the obsessional populations.

6.6.4. Method

Subjects

Student Population

190 undergraduate students at the University of British Columbia participated in a questionnaire study in exchange for 1 course credit. The sample was 65% female, mean age

19 years. The response rate was 81%.

Obsessional Population

225 questionnaires were distributed to individuals who were suffering from obsessive compulsive symptoms. The subjects had all responded to requests for participants to help research OCD and had scored above a clinical cut-off of 11 on the Maudsley Obsessive-Compulsive Inventory (MOCI: Hodgson and Rachman, 1977).

21 questionnaires were returned blank with various explanations (including one person who no longer thought she had OCD); 2 were excluded as not having OCD or ever having had OCD, 1 was excluded as returned with only 2 questionnaires partly filled in, 1 was excluded as it was returned too late.

147 completed questionnaires were returned (response rate 65.3%). Of those, 38 were men (26%), 109 were women(74%). The mean age of the sample was 38 years (range 16-70).

Measures

The TAF Scale (see appendix 2). This scale included 13 questions to evaluate the fusion of thoughts and actions in terms of morality (e.g 'having a blasphemous thought is almost as sinful as a blasphemous action'). 7 questions were used to assess the belief in TAF of negative events happening to a friend (e.g. 'if I think of a friend failing a test, this increases the risk that he/she will fail a test'); 6 questions assessed TAF of negative events happening to oneself (e.g. 'if I think of myself failing a test, this increases the risk that I will fail a test'); 4 questions asked about TAF of positive events happening to a friend (e.g. 'if I think of a relative/friend

winning the lottery, this increases the chance that he will win'); 4 questions asked about TAF of positive events happening to oneself (e.g. 'if I think of myself winning the lottery, this increases the chance that I will win'). Scores were 0 'disagree strongly', 1 'disagree', 2 'neutral', 3 'agree' and 4'agree strongly'. No items were reverse scored.

Maudsley Obsessional Compulsive Inventory (MOCI: Hodgson and Rachman, 1977). This is a 30 item True-False inventory to measure obsessive-compulsive symptoms.

Beck Depression Inventory (BDI: Beck, 1967). This is a 21 item scale which has been widely used in the measure of depression.

Checking Questionnaire (Based on Sher et al., 1983). The questionnaire comprised 23 statements of checking behaviour. Subjects were required to rate the frequency with which they carried out these checking behaviours using a 5 point scale (0=not at all; 4= very often).

6.6.5. Results

Reliabilities

The internal consistency of the full TAF scale was high for both samples (Cronbach's alpha=0.94 for the students, 0.96 for the obsessional group).

Factor Structure

A principal components factor analysis with a varimax rotation was performed on the TAF items separately for each sample. The best solution for the student sample was a 3-factor solution which accounted for 61.6% of the variance. The moral type of TAF emerged as a cohesive factor accounting for 14.5% of the variance. The likelihood type of TAF was split into 2 factors: TAF events for other people ('other likelihood') accounting for 37.4% of the variance, and TAF for events happening to oneself ('self likelihood') accounting for 9.8% of the variance. A Pearson Product-moment correlation coefficient showed a a significant association between other likelihood TAF and Moral TAF, and the self likelihood TAF and Moral TAF (r=0.50 and r=0.41 respectively, p<0.01).

The best solution for the obsessional sample, however, was a 2-factor solution which

accounted for a similarly high 61.1% of the variance. The moral type of TAF accounted for 15% and the likelihood type for 46.1%. A 3-factor solution in the obsessional group had poor simple structure, and the likelihood factor did not divide into other vs self as in the student sample. However, there was a tendency for TAF of positive events to separate from TAF of negative events. Pearson's correlation coefficient for the two subscales was significant ($r=0.49$, $p<0.01$).

Table 6.1. shows the item loadings for both groups on two factors (i.e. combining the different types of likelihood TAF for the student sample for the purposes of comparison with the obsessional population). An item was considered to load on a factor if the factor loading coefficient >0.5).

Table 6.1. The Two-Factor Solution of the TAF Questionnaire.

FACTOR 1 (LIKELIHOOD)	Factor Loading	
	Obsessionals	Students
If I think of a friend/relative losing her job, this increases the risk that he/she will lose her job	.820	.849
If I think of a relative/friend being in a car accident, this increases the risk that he/she will have a car accident	.808	.847
If I think of a friend failing a test, this increases the risk that he/ she will fail a test	.807	.757
If I think of a friend passing a test, this increases the risk that he/ she will pass the test	.803	.719
If I think of a friend/relative inheriting a lot of money, this increases the chance that he/she will inherit a lot of money	.801	.779
If I think of myself being injured in a fall, this increases the risk that I will have a fall and be injured	.796	.517
If I think of a relative/friend obtaining a desirable job, this increases the chance that he/she will obtain a desirable job	.791	.807

Table 6.1 contd.. FACTOR 1 (LIKELIHOOD)	Factor Loading	
	Obsessionals	Students
If I think of myself being in a car accident, this increases the risk that I will have a car accident	.773	.517
If I think of myself inheriting a lot of money, this increases the chance that I will have a lot of money	.772	.748
If I think of a friend's relationship ending, this increases the risk that his/her relationship will end	.755	.730
If I think of harm coming to a close relative/friend, this increases the risk that he/she will come to harm	.749	.787
If I think of a friend/relative winning hte lottery, this increases the chance that he will win	.748	.813
If I think of a relative/friend falling ill this increases the risk that he/she will fall ill	.745	.824
If I think of a friend/relative being injured in a fall, this increases the risk that he/she will have a fall and be injured	.742	.844
If I think of harm coming to myself, this increases the risk that I will come to harm	.679	.527
If I think of myself falling ill, this increases the risk that I will fall ill	.679	(.329)
If I think of myself losing my job, this increases the risk that I will lose my job	.678	(.398)
If I think of myself winning the lottery, this increases the chance that I will win	.655	.694
If I think of myself failing a test, this increases the risk that I will fail a test	.638	(.329)
If I think of myself passing a test, this increases the chance that I will pass a test	.582	(.241)
If I think of myself obtaining a desirable job, this increases the chance that I will inherit a lot of money	.580	(.224)

Table 6.1.cntd.. The Two-Factor Solution of the TAF Questionnaire.

FACTOR 2 (MORAL)	Factor Loading	
	Obsessionals	Students
Having violent thoughts is almost as unacceptable to me as violent acts	.874	.759
Having a nasty thought about someone else is almost as bad as carrying out a nasty action	.869	.764
Thinking about making an obscene gesture to someone else is almost as bad as doing it	.810	.720
Thinking of making an extremely critical remark to a friend is alsmost as unaccepable as actually saying it	.808	.795
Thinking about swearing at someone else is almost as unacceptable to me as actually swearing	.799	.754
Thinking about hitting someone is as unacceptable to me as actually doing it	.784	.617
Thinking about making an obscene remark or gesture in church is almost as sinful as actually doing it	.774	.730
Wishing harm on someone else is almost as bad as doing harm	.773	.559
Thinking of cheating in a personal relationship is almost as unacceptable to me as actually cheating	.767	.669
Thinking unkindly about a friend is almost as disloyal as doing an unkind act	.736	.706
Having a blasphemous thought is almost as sinful as a blasphemous action	.734	.768
Having obscene thoughts in church is unacceptable to me	.685	.673
Having a jealous thought is amost the same as making a jealous remark	.653	.677

Group Differences

Prediction 1b

To fully explore group differences the likelihood component was divided along two

dimensions, other/self and negative/positive. Therefore the TAF scale was divided into 5 subscales for analysis - the moral subscale, other-negative, other-positive, self-negative, self-positive. This is justifiable since the purpose of the analyses was to fully explore the data and the factor solutions were different for the two different samples. A Hotelling's T^2 revealed significant overall differences between the groups on the 5 TAF subscales ($F(5, 308)=20.10$, $p<0.001$). This was followed up by independent groups t-tests for each subscale. The mean scores of the TAF subscales in the obsessional and student samples are given in Table 6.2

Table 6.2 Descriptive Statistics for the TAF Subscales in the Obsessional and Student Samples

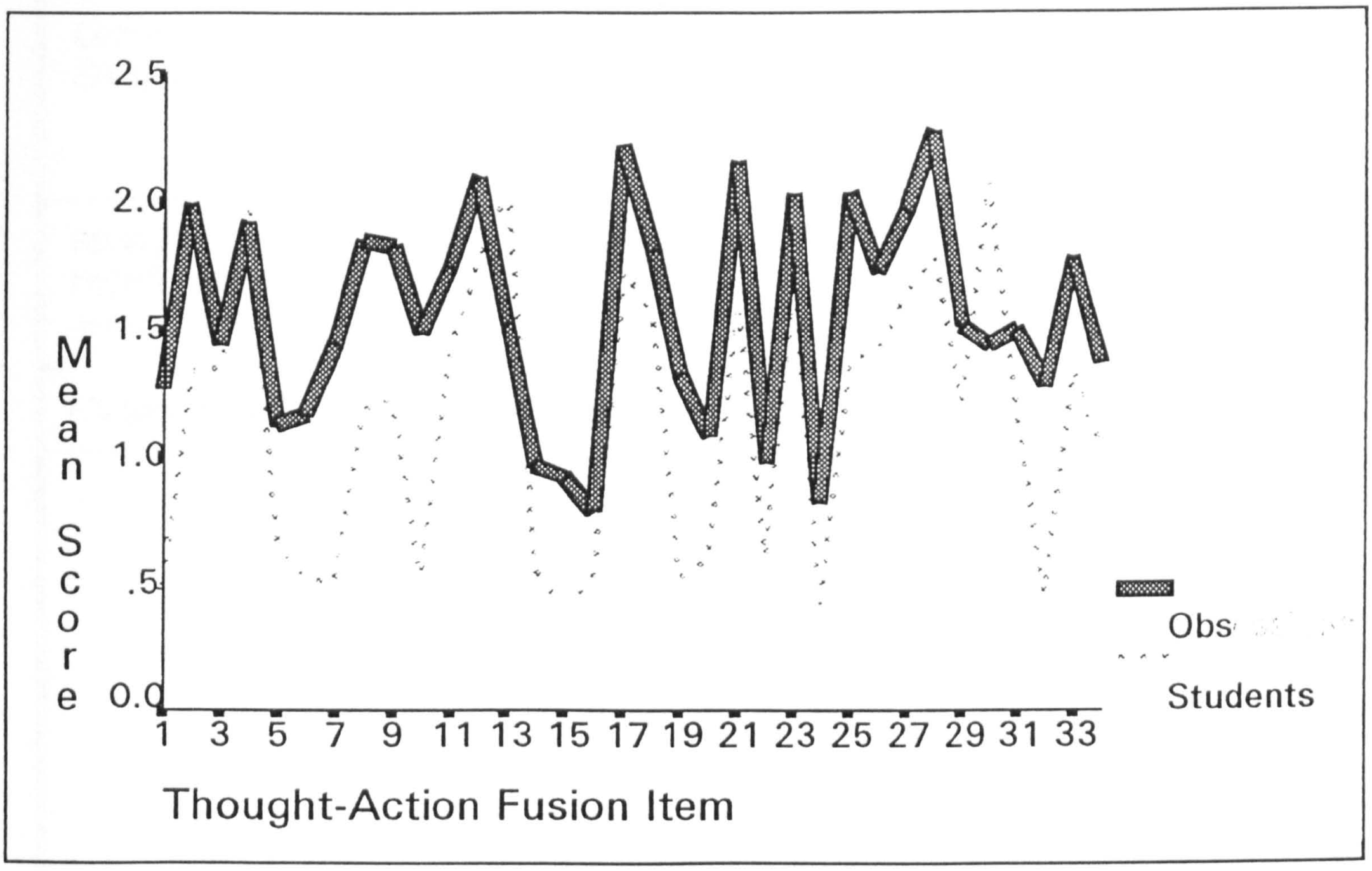
	Obsessionals	**Students**
	Mean (SD)	**Mean (SD)**
Moral	25.74 (14.59)	19.52 (10.59)**
Other Negative	9.17 (8.00)	3.62 (4.83)**
Other Positive	3.88 (3.71)	2.1 (2.72)*
Self Negative	9.89 (6.90)	8.33 (5.63)*
Self Positive	4.76 (4.00)	5.21 (3.13)

*$p<0.05$; ** $p<0.01$.

People in the obsessional sample differed most from the student sample on the other-negative subscale of TAF. Of note, the mean scores did not indicate that the obsessional

group were stating that they believed strongly in TAF; rather, they disagreed with TAF statements less than the student group. However, 35% of the obsessional groups said that they agreed or agreed strongly with at least one example of TAF compared to 19% of the student group who agreed/agreed strongly with a TAF item. The responses of both groups to the individual items can be seen in Figure 6.1.

Figure 6.1. Item by Item Response to the TAF Questionnaire: Obsessional and Student Populations



Associations with Measures of Obsessionality

Prediction 2

Pearson's correlation coefficients were calculated to determine the strength of association between obsessional variables and the moral and likelihood types of TAF. (The likelihood subscales were not examined separately as such numerous analyses would be less interpretable). Owing to the high number of coefficients being computed, alpha was set at $p<0.01$.

Table 6.3. Correlations between obsessional variables and TAF

Correlation Coefficient:	**Obsessional Sample (n=147)**		**Student Sample (n=190)**	
	TAF Moral	TAF likelihood	TAF moral	TAF likelihood
MOCI Total	0.21	0.19	0.29*	0.45*
MOCI Check	0.15	0.29*	0.19	0.44*
MOCI Wash	0.07	0.02	0.27*	0.33*
Checking total	0.30*	0.39*	0.27*	0.39*
BDI	0.27*	0.39*	0.21	0.32*

* $p<0.01$

All significant correlations remained significant when the effects of depression were partialled out. Since TAF is itself a reaction to an unacceptable thought, it is perhaps unsurprising that TAF was highly correlated in both samples with other responses (such as

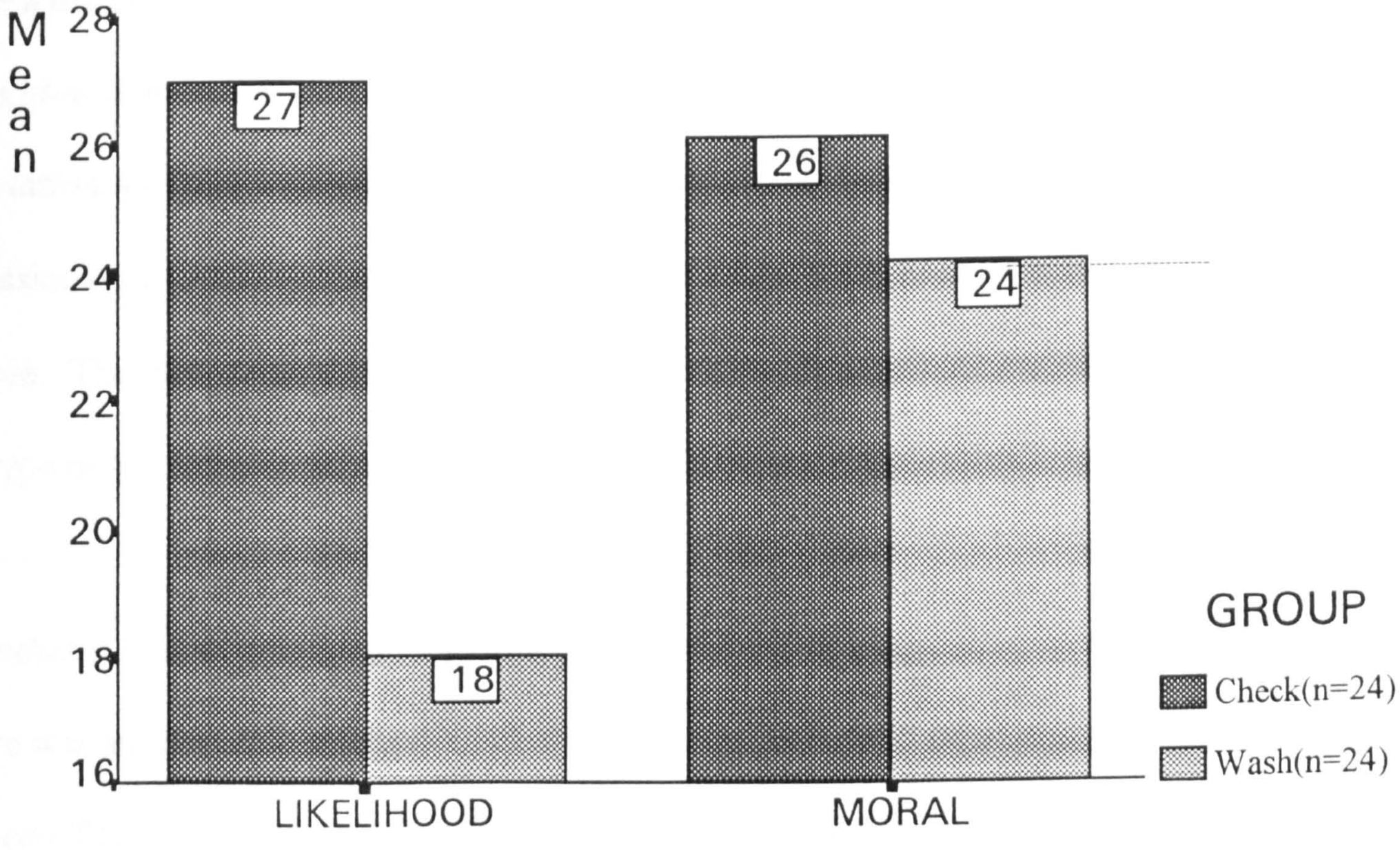
feeling ashamed, guilty or that deep down I really wish to be mean on the occurrence of a 'nasty thought about someone else').

As in the use of the MOCI in the investigation of anxiety (chapter 3), it is possible that the correlations with the MOCI are lower in an obsessional sample than in a student sample, because of the restricted range of the MOCI scores in the obsessional group (All totals >11 and the majority totals <24).

The correlations were mostly consistent across the two samples, with the exception that likelihood TAF was not related to washing behaviour in the clinical sample, and was in the student sample. In both samples, the likelihood TAF was more strongly associated with checking behaviour than the moral TAF. Of particular interest is the strong relationship between behavioural responses to images and impulses (as opposed to the occurrence of the images and impulses per se) and the belief in TAF.

Analyses were conducted in the obsessional sample dividing subjects into those with exclusively washing compulsions (n=24), and those with exclusively checking compulsions (n=24). The results can be seen in Figure 6.2. An independent groups t-test showed that those with checking compulsions were significantly higher on the likelihood TAF; there was no difference between the groups on moral TAF ($t=2.2$, $p<0.05$ and $t=0.58$, $p>0.05$ respectively.

Figure 6.2. TAF in checkers vs cleaners/washers



Summary of Results

Hypothesis 1. In obsessional subjects, TAF occurs at one end of a continuum of TAF..

There was partial support for this hypothesis. Prediction 1a, *the factor structure of the TAF questionnaire will be similar across both a normal and obsessional population* was only partially supported. The TAF scale was highly reliable and accounts for a large percentage of the variance in both a student and an obsessional population. The factor structure, although broadly similar in that a 2-factor solution identified both moral and likelihood TAF in

the two groups, differed when a 3-factor solution was extracted. The best factor solution for the student sample was moral TAF, self-likelihood TAF, and other-likelihood TAF. The obsessional group did not distinguish between self-likelihood and other-likelihood but perhaps made a distinction between likelihood TAF for positive and negative events. Prediction 1b, *thought-action fusion occurs more in an obsessional population than in the normal population, was fulfilled.* Although neither group strongly endorsed TAF beliefs, 34% of the obsessional sample reported agreeing a TAF statement compared with 19% of the student sample. Therefore, endorsements of TAF varied with the statement and were dependent on the type of event (positive/negative) and who was involved (self/other).

Hypothesis 2. TAF is related to measures of obsessionality

There was support for this hypothesis. Prediction 2a, *there will be a positive correlation between TAF and measures of obsessionality in the normal and obsessional populations,* was fulfilled. TAF was associated with checking behaviour in particular, and with other obsessional characteristics, notably responses to unwanted images and impulses, and responses to a negative thought. Likelihood TAF was stronger in those with checking behaviours compared to those with primarily washing behaviours.

6.6.6. Discussion

The aims of the study were to develop a reliable, valid questionnaire measure of TAF and to examine the relationship between TAF and other obsessional variables. These aims were achieved and there was evidence for two distinct but related types of TAF in the

questionnaire, as predicted. The questionnaire also had criterion validity in that an obsessional sample scored more highly on all the subscales, except for TAF relating to positive events happening for oneself. The largest difference between the two groups on the likelihood subscale was related to belief in TAF for negative events happening to other people. It seems as though both students and obsessionals may believe (or not) in the 'power of positive thinking' to the same extent when it relates to themselves, although there was a non-significant tendency for the obsessional group to disbelieve more that their thoughts could bring about good events for themselves. However, this tendency is reversed when it comes to thinking about good thoughts for other people. The student group disagree more that their thoughts can bring about good events for other people compared to the obsessional group. Most notably, however, the student group more strongly disagree that their bad thoughts about other people can increase negative events, compared to the obsessional group.

Some obsessional respondents believed in some type of TAF more than others, and some students believed in some types of TAF more than others in their group. These beliefs are themselves not intrinsically odd or maladaptive, and only occur in a minority of the obsessional and student population. However, since a significant minority (19%) endorsed a type of TAF statement, it is reasonable to conclude that TAF is on a normal continuum and thus is better considered within the C-B model of OCD than a 'basal ganglia deficit' model (Rapoport and Wise, 1988). Furthermore, by noting the influence of TAF, it is possible to reconcile Carr's (1974) model of risk appraisal, in which obsessionals are considered to have increased probability estimates for threat, with Salkovskis's view that it is the appraisal of intrusions in terms of responsibility that is fundamental to the disorder.

This initial study was speculative but gives rise to a number of exciting ideas and suggestions of future work. Firstly, the relationship between TAF and guilt and responsibility is of interest. It is presumed that TAF will lead to an increase in perceived responsibility, but it is also possible that an increase in perceived responsibility will result in an increase of TAF, perhaps via suppression of thoughts. The direction of causality should be established with an experimental manipulation, and such work is currently being conducted in Vancouver. The

direction of causality is particularly important since it is easy to confuse TAF with the belief that thoughts reflect a real world event. For example, if a husband thinks about harming his wife and makes the appraisal that 'I would not be having this thought unless there is a real chance of it happening', this would increase probability estimates for the negative event. However, it would not mean that the person perceived himself/herself to have increased the likelihood of the event occurring owing to his/her own cognitive processes.

Second, the association between TAF and guilt is of interest. Preliminary work from an undergraduate project which I supervised has shown that moral TAF is strongly associated with obsessionality in 120 non-student adults and with state and trait guilt (Watkins, Shafran and Charman, 1995). Again, experimental designs are needed to assess causality. It is possible that the different types of TAF are associated with different types of guilt - perhaps likelihood TAF is more related to 'obsessional guilt' and moral TAF is more related to 'depressive guilt', as outlined in chapter 5. In turn, perhaps the different types of guilt are associated with different obsessional phenomena, for example likelihood TAF may be associated with obsessional guilt and inflated perceived responsibility for negative events and checking behaviour, whereas moral TAF could be more closely connected with depressive guilt and washing behaviour. This proposition is summarised below and leads to a series of predictions, the most obvious one being that an episode of depression is predicted to increase washing behaviour in people with checking compulsions, and an elevation in perceived responsibility will result in checking behaviour in people with washing compulsions. Although, this is speculative, it may perhaps lay the foundations for future experiments in the area.

The situation specificity of TAF is also an important area for future research. Only a minority, 34%, of the obsessional sample endorsed a TAF statement. However, several commented that their responses would be completely different if they were in 'obsessional' mode. The endorsement of TAF is predicted to be much higher if the subject were exposed to a feared stimulus and prevented from carrying out a response. If this does turn out to be the case, it implies that cognitive work challenging beliefs about TAF should be done when the subject is carrying out exposure in vivo in addition to when he/she is sitting calmly, depending on the extent of the TAF and associated anxiety levels.

In summary, TAF may be one path in which intrusive thoughts are given significance and stimulate action for some individuals with OCD. Further empirical studies are need to determine how this pathway may work.

6.7. Summary of investigation of the Cognitive-Behavioural Model

The studies conducted so far have provided support for the importance of anxiety, moral conflict, guilt and perceived responsibility for threat in obsessional problems. Since these features comprise the C-B model of OCD, the studies can be considered to have provided support for the model. In addition, the findings have expanded the model in the following ways:-

1 The findings have helped to specify more precisely the type of anxiety that is important in obsessionality ('fear of fear' and 'cognitive anxiety' as opposed to 'somatic anxiety).

2 The studies have indicated that it may be the conflict between obsessional problems and the moral code of a person's religion that is important in obsessionality, as

opposed to the degree of religiosity per se.

3 Trait guilt is of particular importance in obsessional difficulties. Although there were no differences in guilt levels between people with checking and cleaning compulsions, depression played a greater part in cleaning compulsions. It was suggested that two different types of guilt may be important in obsessional difficulties.

4 Studies on perceived responsibility for threat have indicated that the sort of responsibility that was inflated in OCD may be specific, and not a general inflation of all types of responsibility.

Manipulation of responsibility in a natural way led to changes in obsessional variables and there was evidence of an association between pathological responsibility and guilt, independent of depression.

5 A cognitive bias, in which thoughts and actions are fused in a moral manner and in terms of likelihood of the event, has been identified. Although only a minority of obsessional subjects had this bias, there were significantly more obsessional subjects endorsing TAF beliefs than student subjects. A questionnaire has been developed with high reliability, and there is good evidence that it is valid. Future research of TAF and its clinical implications were discussed.

6.8. The Following Chapters

The next chapter moves away from investigating the C-B model of OCD. Instead, the focus changes to providing data to test the hypothesis that OCD is a heterogeneous disorder, and that some patients have a neurological deficit (basal ganglia deficit), whilst others have

difficulties that are best conceptualised within a C-B framework. There is a strong need to try to reconcile the C-B model with a neurological deficit model, since the majority of work being conducted in the USA is considered within the context of a deficit. This is exemplified by a recent 'Up-to-the-minute' account of OCD which has only 2 pages on the behavioural model of OCD, and no mention of cognitive developments. Although theoretically a neurological deficit model need not conflict with the C-B model - both are explanations at different levels - in conceptual and practical terms the models are at loggerheads. Thus it is becoming more common to find patients referred to a psychologist claiming that they know it is caused by a chemical imbalance,and querying the value of behaviour therapy to change brain chemistry (Rachman, 1992; personal communication).

The next chapter outlines a widely investigated basal ganglia deficit model of OCD, and reports on a study of neurological soft signs. The purpose of this study was primarily to generate data to test the heterogeneity hypothesis, although the findings are also interesting in their own right. The following chapter reports on an investigation of neuropsychological tests in people with OCD, again with a view to testing the heterogeneity hypothesis, and being of intrinsic interest. The testing of the heterogeneity hypothesis is reported in the ninth chapter. The tenth and final chapter of the thesis summarises the investigation of the C-B model, its reconciliation with the neurological deficit model, discusses the clinical implications of the research and makes suggestions for further work.

CHAPTER 7

The Basal Ganglia Deficit Model of OCD and a study of Neurological Soft Signs

The following paragraph is an excerpt from a book on OCD written for children:-

"'It's like your brain has the hiccups. That is what makes you want to do all that checking and counting and washing over and over again. So you see, Polly, just like a computer that isn't working correctly, your brain can get stuck sometimes, too.'

Polly's mom was very relieved that they had found out what was making Polly do all these funny things. But she still wanted to know what they could do so that Polly could stop all this weird stuff and be the way she used to be before she got sick with OCD.

'I'll send Polly to a special doctor who will try to find a medicine that may help Polly not need to do all these things. Sometimes the right medicine and vitamins can help a lot,' said Dr. Jay." (C. Forster, 1994).

7.1. Introduction

The basic assumptions of the neurological deficit models of OCD are described in the opening section of this chapter. The basal ganglia deficit model is described in detail, and evidence for the model is critically reviewed. The relevance of the model to the heterogeneity hypothesis is examined. The model predicts that patients with OCD will have neurological soft signs (NSS), and a study is reported which establishes NSS in subjects with OCD with

a view to testing the heterogeneity hypothesis and for intrinsic interest.

7.2. Neurological Deficit Models

The crux of neurological deficit models is that a structural or functional brain abnormality is the cause of OCD. These models place OCD within the realm of 'abnormality' and patients with the disorder are considered to be qualitatively different from the normal population. The models are one of disease, and are based on the medical model (Kraeplin, 1883) in which clusters of symptoms are assumed to be a direct reflection of a physical disease process. It is not disputed that psychological phenomena have neurological substrates, and the search for such substrates may provide an explanation of OCD at a different 'level' to that which describes psychological phenomena. However, the utility of mapping complex psychological phenomena, which could be socially constructed, to specific neurological 'sites' is questionable (Hallam, 1985b). However, neurological deficit models are in conflict with psychological models such as the C-B model, in that the conceptualisation of the disorder as 'abnormal' and reflecting disease is in direct opposition to the assumption within the C-B model that the disorder is on a continuum with normal behaviour.

7.3. Basal Ganglia Deficit Models

In order to understand the effects on a person when a system is dysfunctional, it is important to know the normal functioning of such a system. For example a model of dyslexia is only possible in the context of a model of normal reading ability (Bradley and Bryant, 1985). Until recently, the function of basal ganglia was thought to be restricted to motor control. Now that is considered over-simplified and the basal ganglia are thought to comprise a series of a parallel array of `loops' including the striatum, pallidum, thalamus and cerebral cortex (see Goldman et al., 1990). These loops connect the basal ganglia with the cortex;

sensorimotor information may be relayed to prefrontal areas and associational information is relayed to the premotor areas. (Goldman et al., 1990). The basal ganglia serve to specify the combination, direction and sequence of collicular neurones that should discharge (Chevalier and Deniau, 1990). In this way the basal ganglia are involved with the sensorimotor aspects of movement and conditional aspects of planning movements, program selection and motor memory and retrieval. In other words, the basal ganglia are critical in the mechanism for the attainment of goals (Gray, 1995). Graybiel (1990) suggests that neurotransmitters in the basal ganglia reflect the role of the basal ganglia in the modulation of behaviour based on sensorimotor, memory-related and conditional cues derived from the neocortex and limbic system.

There are several `basal ganglia hypotheses', and there is a lack of agreement amongst the proponents of each hypothesis. The different models will not be described in detail, since the aim of the investigation was not to test the basal ganglia deficit models per se, but rather to generate data to test the hypothesis of heterogeneity. The core features of the hypotheses will be described in order to provide a context for the prediction of the model that neurological and neuropsychiatric impairments will characterise OCD (see chapter 9).

Moddell et al., (1989) have proposed that dysfunction of neuronal circuits interconnecting the orbitofrontal cortex, basal ganglia/limbic striatum, and thalamus underlies the pathogenesis of OCD. The ventromedial (limbic) portions of the striatum are thought to modulate activity in the frontothalamic circuit through a negative feedback loop. Inadequate integration of inhibition in the reciprocally excitatory frontothalamic neuronal interchange is hypothesised to give rise to an aberrant positive feedback loop in this interchange. This aberrant positive feedback loop is thought to give rise to obsessional symptoms. Insel (1988) conducted an ethological analysis in order to determine the factors that induce, maintain and terminate

the compulsive behaviours which characterise obsessive-compulsive behaviour. The behaviours were conceptualised as a link between social influences and neural events, and Insel suggested that the stereotyped motor acts that are seen in OCD could be like displacement behaviours in animals:- they are triggered by conflict between two opposing tendencies and then, once started, continue in an autonomous fashion. Displacement behaviours were first described in detail by Lorenz in the 1930s (see Lorenz, 1970), and it was Holland (1974) who proposed that the behavioural excesses of OCD patients resembled those of animal displacement phenomena. Displacement behaviours also arise in a vacuum.

The displacement behaviours that animals exhibit include grooming and washing behaviours, and the quality of displacement behaviour could be described by the term 'fixed action pattern', which determines the 'all or nothing' quality of the displacement (and obsessional) behaviour. In sum, the neuroethological model of OCD 'proposes that the symptoms of this disorder are similar to animal displacement behaviours and that similar mechanisms are responsible for each' (Stein, 1992).

In this model, the displacement behaviours are dependent on a combination of serotonergic inputs, basal ganglia mediation and learning. A deficit in any of these systems or environmental confinements (Voith, 1985) could create a disorder in displacement behaviour.

Baxter and colleagues (1990) suggest that 'the primary **disease** in OCD might be in the striatum and that the abnormal behaviours of OCD are mediated by a dysfunctional integration of this brain region with other, mainly cortical brain regions that, as a direct consequence, must increase their activity to abnormal levels" (p.180; emphasis added). They suggest that impairment in the gating and screening functions of the striatum result in phenomena coming into awareness, as they are not being inhibited ('controlled') by the

striatum and associated cortical mechanisms, particularly the limbic region. The obsessional urges 'leak through', as do compulsive motor behaviours in response to sensations and thoughts not being inhibited. Rituals and avoidance are all seen as conscious efforts to combat the impulses. The impaired system also results in difficulties in termination of the motor act or impulsive thought and thus perseveration of the obsessional symptom would ensue. Pitman (1989) has suggested that disruption of the basal ganglia system may leave the organism unable to disattend to irrelevant stimuli, and inappropriate response patterns may persist. The suggestion of Baxter and Pitman is reminiscent of Frith's model of schizophrenia in which positive symptoms of schizophrenia were attributed to `a defect in the mechanism that controls and limits the contents of consciousness' (Frith, 1979).

The most well-developed 'basal ganglia hypothesis' is that of the NIMH group (eg Wise and Rapoport, 1989). This hypothesis proposes that the striatum acts to trigger behaviour, and that inappropriate triggering of genetically stored and learned behaviours is the primary cause of OCD (Rapoport and Wise, 1989). This hypothesis is described below.

7.3.1. The basal ganglia deficit model of the NIMH Group

The theory proposed by Rapoport also suggests that obsessional phenomena result from a dysfunction of the basal ganglia in releasing the behavioural response. When functioning, it is suggested that the neurons in the basal ganglia fire a `fixed action pattern' to give rise to motor behaviour. Fixed action patterns are defined by ethologists as spontaneous, stereotyped behaviours that are independent of immediate external control and individual learning (Eibl-Eisfeld, 1970) ; they included, e.g., nest-building in birds, food burying in pigs, grooming behaviours and hoarding.

The fixed action pattern is usually triggered by stimulus detection but can be triggered

without a key stimulus as in the case of vacuum or displacement behaviours. These are behaviours that are emitted out of context, i.e. apart from situations that usually elicit them (Tinbergen, 1949; Lorenz, 1971). Holland (1974) first suggested that these behaviours resemble the compulsions of OCD, and Rapoport suggests that basal ganglia dysfunction giving rise to displacement activity is the cause of OCD.

The striatum contains stimulus detectors - pattern-recognition circuits and internal motivation detectors. These striatal assemblies converge to inhibit a pallidal cell assembly, resulting in disinhibition of the thalamic cell group and releasing behaviour. In addition, striatal serotonin afferents potentiate inputs to the striatum. Thus, normally, the stimulus causes cells in the striatum to discharge, releases the thalamus from inhibition and releases appropriate behaviour. Alternatively, action in the cingulate cortex can serve as an internal motivation detector and act on cells in the thalamus in the same way without an appropriate stimulus. Hyperactivity in the cingulate cortex or striatum can cause disinhibition of the thalamus and release of behaviour. This hyperactivity could be caused by an increase in the serotonergic excitatory inputs to the striatum. In addition, if the output of another circuit were blocked or dysfunctional, build-up of basal ganglia activity might cause `sparking over' to displacement activity which Rapoport suggests is manifest as OCD (Wise and Rapoport, 1989). Obsessional thoughts are likened to motor acts of the mind or 'mental tics'.

Although the authors state that 'the present hypothesis views the basal ganglia and OCD in a high cognitive context' (Rapoport and Wise, 1988) it is not clear how the transition from excess neuronal activity to a high cognitive context is made.

7.4. Evidence for a Basal Ganglia Dysfunction

There is an abundance of evidence cited to support the hypothesis that OCD patients suffer from a dysfunction in the basal ganglia. Although none are convincing alone, the convergence of the evidence is considered by some to provide support for the theory (e.g. Jakes, 1994, personal communication). The most influential studies have been those which have involve neuroimaging.

7.4.1. Neuroimaging Studies

These studies provide evidence that OCD patients may have a dysfunction in the basal ganglia. Computerised Tomography (CT) scans were among the first such scans to be conducted, but only the study of Luxenberg (1988) found atrophy of the head of the caudate nucleus, whereas other CT scans were normal (Insel et al., 1983; Behar et al., 1984). Magnetic Resonance Imaging (MRI) studies (Garber et al., 1989; Weilberg et al., 1989) failed to detect any brain abnormalities in OCD patients. A detailed review is not provided here as the findings up until 1990 are reviewed by Baxter and colleagues (1990) and by Insel (1992). Baxter's review emphasizes the high probability of type 2 (false negative) error in all the studies which have used small numbers of subjects. Whether the studies provide consistent findings or not is disputable. The studies of the UCLA group (led by Baxter) and the NIMH group led by Nordhal using Positron Emission Tomography (PET) scans suggest that OCD patients have an increase in the normalised metabolic rate in both orbital gyri, and normal metabolic rates in the caudate nucleus. The other NIMH group (led by Swedo, 1989b) did not find a significant increase in the orbital gyri, but found increased normalised metabolic rates in the right lateral prefrontal and left anterior cingulate regions only. These data were interpreted as providing evidence of a frontal lobe-anterior cingulate-basal ganglia loop

dysfunction.

Baxter notes that 'different methods used in PET studies makes them difficult to compare. There were marked differences in scanners, stimulus conditions, and perhaps of most importance, in the methods used to determine neuroanatomic regions of interest and to calculate absolute and normalized metabolic rates'. This may be used to account for the discrepant findings of Martinot (1990), who found evidence of decreased metabolic rate in the prefrontal cortex, compared to the PET study of Sawle (1991) whose findings included evidence of an increase in metabolic rate in the prefrontal cortex.

Insel (1992) regards 'increased metabolism of the orbitofrontal cortex in untreated patients with OCD, as well as normalization in the orbitofrontal cortex and caudate nucleus with recovery' to be 'relatively consistent' and 'too interesting to ignore with regard to possible functional implications', whilst acknowledging that 'a single structure (or cluster of structures) is unlikely to be the cause of this disorder and the data do not yet define a cause'. Single photon emission computerised tomography (SPECT) studies such as that of Machlin et al., (1991) and Rubin et al., (1992) implicate the medialfrontal cortex and the orbitofrontal cortex bilaterally, the dorsal parietal region, the left posterofrontal cortex and the head of the caudate nucleus bilaterally. The two studies themselves were inconsistent,which is attributed to differences in scanner resolution and frequency of sampling.

An alternative explanation for the discrepancies in findings across studies may be able to explain part of the inconsistencies in findings. An interesting study by Baxter and colleagues (1992) found that the caudate glucose metabolic rate (which had been found by some PET studies to be abnormal in OCD patients) changed with administration of both pharmacological and behavioural therapy. Similarly, McGuire and colleagues (1994) showed that the identified areas altered as the patient was exposed to different feared stimuli in vivo whilst being scanned. The

authors interpreted their findings as evidence against any structural or functional abnormality in the basal ganglia region, *but* instead argued that any brain changes are reflective of the symptomatology, rather than the cause of it. The small sample size (n=4) and lack of control group are methodological flaws of this study which needs to be extended and replicated. The observations of blood flow change with symptom change are statements of the obvious. For example, anxiety increases blood flow in the orbitofrontal cortex of normal controls; obsessionals (who are highly anxious) would therefore have a comparatively higher blood flow in this area. Decreases in blood flow would be associated with an improvement in symptoms. Thus neuroimaging data are 'not necessarily evidence for a neurological dysfunction nor .. necessarily evidence that these brain areas are critical to the experience of obsessional disorder' (Salkovskis 1995).

The finding that the symptoms are critical for the neuroimaging results implies that OCD symptom severity should be correlated with basal ganglia abnormalities. With the exception of the study by Swedo et al., (1989) and Rubin et al., (1992), OCD symptom severity has not been reported to be correlated with the basal ganglia abnormalities. This provides an obstacle for basal ganglia theorists, who would predict that a severe basal ganglia dysfunction would result in more displacement activity (Rapoport's model) or 'leakage into consciousness' (Baxter's model). Furthermore, the change in brain functioning with symptom change highlights the need for anxiety controls in the neuroimaging literature in order that the specificity and importance of the relationship between symptoms and brain functioning can be properly ascertained.

7.4.2. Neurological Soft Signs

OCD patients are hypothesised to show an abnormally high number of neurological

soft signs (NSS) which are considered to be indicative of a basal ganglia disorder. A neurological soft sign is 'a particular from of deviant performance in the neurological status examination.' (Shaffer et al., 1985). It refers to any neurological deviation (motor, sensory or integrative) that does not localise the site of a putative central nervous system lesion (Quitkin et al., 1976). The designation *soft* is usually taken to indicate that the person with the sign shows no other feature of a fixed or transient neurological lesion or disorder (Shaffer et al., 1985). Soft signs are important clinically as they implicate a central nervous system 'factor' that might have causal or predictive value for psychological difficulties.

It is possible to postulate that impaired integration of sensory units, motor co-ordination and sequencing of motor patterns reflect abnormalities in parietal lobe, cerebellum and frontal lobe respectively but this is an 'erroneous simplification' (Heinrichs and Buchanan, 88). Instead, NSS 'reflect impairments in several functional systems that included in their neurological substrate the previously mentioned regions. The actual location of neurological deficits need not be at these sites but may involve components of these systems at other levels of the neuroaxis.' Such components could be found in the basal ganglia and brainstem (Kennard, 1960) or limbic system (Mosher et al., 1971). Chen et al., (1995) believe that 'the relationship between a particular sign and a cerebral location is likely to be complex' (p.4).

Studies on the relationship between the presence of NSS and brain abnormalities as shown by CT scans have proved inconsistent (e.g. Weinberger and Wyatt, 1982; Kolakowska et al., 1985, King et al., 1991, and Schroder, 1992). Part of this may be attributable to differences in methodology. Sample size, diagnosis, temporal stability, medication and demographic variables should all be considered. Most importantly, it is vital to have a reliable, standardised assessment in order that meaningful comparisons can be made across populations when considering NSS.

NSS are developmental signs whose persistence in later years is associated with hyperactivity (e.g. Mikkelsen et al., 1992), impulsivity (Paulsen and O'Donnell, 1979), learning disability (e.g. Adams et al., 1974), anxiety and depression (Shafer et al., 1983) and impulsivity in adults (Quitkin 1976), and with anxiety and affective disorders in later adolescence (Shaffer et al., 1985, 1986). No relationship was found between early soft signs and attention deficit or conduct disorders (Shaffer et al., 1986) although such disorders are hypothesized to be associated with basal ganglia dysfunction and obsessional neurosis (Bolton and Turner, 1984).

Quitkin et al.'s (1976) study was the first to assess neurological soft signs specifically in adults in a systematic matter. Three hundred and fifty patients were examined in this study which claimed increased evidence of neurological soft signs for the subgroup of patients with emotionally unstable character disorders (who are antisocial, impulsive and have short, nonreactive, bipolar mood swings) and for patients who had schizophrenia with premorbid asociality. Patients with other types of schizophrenia and character disorder did not show evidence of neurologic impairment; no normal control group was included. Since then, neurological soft signs in patients with schizophrenia have been described by several researchers (e.g. Walker and Green, 1982). A review by Heinrichs and Buchanan concluded that 'cumulative evidence strongly argues that there are more neurological signs in schizophrenic patients' (p.11).

Most recently, the neurological soft signs of sixty-two schizophrenic patients were compared with those of one hundred normal controls in the course of the development of the Cambridge Neurological Inventory (Chen et al., 1995). The data reported showed that schizophrenic patients had significantly more neurological soft signs (motor and sensory) than the normal control group (see later).

Signs of central nervous system dysfunction in obsessive-compulsive disorder have been examined in both children and adults (Denckla et al, 1988; Hymas et al., 1991 and Hollander et al., 1991). In her uncontrolled study of 54 children and adolescents with OCD, Denckla adapted Quitkin's 'Physical and Neurological Examination for Soft Signs (PANESS)' to form the 'Neurological Examination for Subtle Signs (NESS)'. She found that 44 (81%) of the sample showed neurological abnormalities such as 'choreiform' movements and miscellaneous neuro-developmental abnormalities. Seventeen adults with obsessional slowness were given a standard neurological examination and motor examination, which revealed subtle neurological abnormalities more frequently than in matched normal controls (Hymas et al., 1991). The abnormalities included loss of motor fluency, hesitancy of initiation of limb movements, speech and gait abnormalities, cogwheel rigidity, complex repetitive movements and tics. There was no association between the extent of the neurological abnormalities and the degree of obsessionality. The findings (amongst others) were suggested to show that 'patients with obsessional slowness may have a dysfunction in the frontal-basal-ganglia loop system.

NSS were examined in 37 drug-free non-depressed subjects with obsessive compulsive disorder and 20 healthy volunteers (Khanna, 1993). The group with OCD had significantly more total NSS than the controls. The largest study of NSS in people with OCD used a battery based on that which was originally designed to assess NSS in schizophrenics, but extended to included visuo-spatial tasks (Hollander et al., 1990). This study found that 41 medication-free patients had significantly more neurological soft signs than the control group (n=20). The abnormalities were in fine motor co-ordination, involuntary and mirror movements and visuo-spatial function. Soft signs were related to the severity of obsessions but not compulsions in the patient group. It was concluded that the neurological impairment

found in patients with OCD should be compared with that of other psychiatric populations (Hollander etal., p.27).

In summary, although the presence of neurological soft sign does not indicate a dysfunction at a particular site, a high prevalence of neurological soft signs would be consistent with a basal ganglia dysfunction. Some evidence shows that people with OCD have abnormal NSS, which supports the basal ganglia hypothesis.

7.4.4. Relevance of Tests of Neuropsychological Functioning

The literature regarding neuropsychological test performance of patients with OCD will be discussed in section 8.2 of the thesis. However, it is important to note that, if the basal ganglia hypothesis were correct, OCD patients would perform poorly on tests of neuropsychological functioning, in particular those which involve visuo-spatial skills which require the basal ganglia. Since the suggested deficit also involves the fronto-striatal loop, deficits would be expected on tests of executive function (including set-shifting and inhibition of unwanted stimuli,) since these are thought to require an intact frontal lobe (Milner, 1963). This is not to say that these tests have a 'localising function', but rather that they can be used to identify the cognitive strengths and weaknesses associated with a disorder (Otto, 1992). It is fair to say that, if the basal ganglia were damaged in the manner suggested by the basal ganglia hypothesis, a poor performance on tests of executive function, inhibition and visuo-spatial abilities would be expected.

Although some studies have found evidence of neuropsychological deficits of executive function, the results have been inconsistent. The results concerning visuo-spatial difficulties are also hard to interpret, as deficits are only found in some studies and not others.

7.4.5. Relationship between OCD and basal ganglia disorders

As the historical review in chapter 1 indicated, obsessive-compulsive phenomena have been associated with post-encephalitic disorders. Since the publication of the monograph of von Economo (1917, translated 1931), compulsive behaviour has been observed in post-encephalitic disorders, including Parkinson's Disease. Post-encephalitic disorders are thought to be disorders of the basal ganglia. Lewis (1957) cites work reporting the presence of obsessive-compulsive phenomena in extrapyramidal disorder, Parkinsonism and chorea. Recent findings apparently confirm a higher incidence of obsessive-compulsive symptoms in Sydenham's Chorea (Swedo et al., 1989a), although there is no evidence for Huntington's disease-like cognitive dysfunction in OCD (Martin et al., 1993).

Much research has focused on the link between Tourette's Syndrome (TS) and obsessive-compulsive behaviour (e.g., Pauls et al., 1986, 1992; George et al., 1993; Holzer et al., 1994). Studies have found between 37%,47%, 52% and 90% of individuals with TS have Obsessive-compulsive symptoms according to semi-structured interviews and questionnaire measures (Robertson et al., 1988; van de Wetering et al., 1988; Frankel et al., 1986; Nee et al., 1980). Specifically, Pitman et al., (1987) found that 63% of their patients with TS had obsessive-compulsive disorder according to the Diagnostic Interview Schedule.

Pauls et al., (1986) designed their own semi-structured interview and assessment based on DSM - III criteria for OCD and TS. OCD was found in

- 50% of probands.
- 19% of relatives of probands with TS + OCD
- 27% of relatives of probands with TS but no OCD
- 0% of adoptive relatives (5 families)

The authors concluded that TS and some obsessional disorders were aetiologically related (at

least within families of TS patients) and OCD represents a different manifestation of the same underlying factor. A common sex-linked TS/OCD gene expressing itself as TS in males and OCD in women has been suggested and findings from a further large family study are consistent with earlier work (Pauls et al., 1992, 1995). Alternatively, relatives of TS patients with OCD have been considered to have a genetic sub-type of OCD due to the incomplete expression of a TS gene (Comings and Comings, 1987). The 5-HT1A serotonin neuroreceptor and tryptophan oxygenase genes have been excluded as the TS/OCD candidate gene (Brett et al., 1995).

However, unlike the other disorders, it is still disputed as to whether TS is actually a disorder of the basal ganglia (Shapiro and Shapiro, 1992) and to cite, as the Rapoport group frequently does (e.g. Wise and Rapoport, 1989; Rapoport, 1990), a *possible* link between OCD and a *possible* basal ganglia disorder as evidence in support of OCD as a basal ganglia disorder is at best weak and tenuous evidence in support of a theory.

Other difficulties exist with these data. It is possible that there is no genetic influence, but that `compulsions' are learned imitations of the TS behaviours (de Groot and Bornstein, 1994). Symptoms of chorea and TS may well register as compulsions on measures of obsessive-compulsive disorder, and behaviours resembling compulsions may be seen in diseases of the basal ganglia (Shapiro and Shapiro, 1992). The need for a clear conception and definition of tics, obsessions and compulsions has been emphasized (Hollander et al., 1989). There are two important points to be made here. The first is that a similar phenomenology does not mean that two disorders have a similar aetiology. The second point is equally important : OCD is NOT merely the presence of compulsions. Stereotypical motor behaviours do not comprise OCD. The warning of Aubrey Lewis (1936) showed great foresight and is worth repeating:-

'In the writings of some psychopathologists it is assumed that a ritual or ceremonial

is, ipso facto, obsessional - ignoring the absence of the essential subjective features of compulsion. Repetitive mental happenings and more or less stereotyped motor activities occur in a wide range of illnesses... But clearly, by observing that a ritual or repetitive motor activity is pursued, whether it be with or without anxiety, with or without evident purpose, one cannot tell that it is an obsessional activity... The experience of subjective compulsion is the essential feature of obsessions... Without such final criteria all other problems of obsessional disorder lose their sharpness and even their reality; the very term or conception 'obsessional' becomes worthless, because it can then be extended to cover everything'. (p326).

The warnings of Aubrey Lewis against generalising from obsessive-compulsive phenomena to the presence of obsessive-compulsive disorder have been ignored by the proponents of the basal ganglia model.

7.4.6. Brain Lesions

Evidence concerning the association between head trauma and OCD can be found mainly in the form of case studies (see Jenike, 1990 for a review). Discrete caudate-frontal lesions evoke obsessive-compulsive behaviour (Tonkonogy and Barreira, 1990), obsessive-compulsive disorder has been observed to emerge after brain injury (McKeon et al., 1984; Kettle and Marks, 1986; Max et al., 1995), and there is a reported association between birth trauma and obsessive-compulsive disorder (Capstick and Seldrup, 1977). Naturally occurring brain lesions are usually not circumscribed and it is therefore difficult to use these data to support specific theories regarding basal ganglia dysfunction. The use of circumscribed psychosurgery has shown that a lesion of the cingulate gyrus alleviates OCD (see Chioccoa and Martuza, 1990; Mindus et al., 1994) although its effectiveness may be mediated by

alleviation of anxiety rather than directly via the basal ganglia. Again it is hard to infer function from dysfunction without demonstrating double dissociative effects.

7.4.7. Animal Models

Empirical data in support of this hypothesisare sparse, but includes the study of Voith (1985) in which dogs suffered from a disorder of grooming, giving rise to acral lick dermatitis. Dogs with this condition improve when given clomipramine (CMI; Goldberger and Rapoport, 1991; Rapoport et al., 1992). Three of five dogs in the open trial of CMI in the treatment of acral lick dermatitis improved in the study of Stein (1992), which is consistent with the hypothesis that a specific serotonergic dysfunction is the basis for dysfunction of displacement behaviour in animals.

Aside from the general sociobiological criticism that it is hard to generalise from animal models to those of humans, the proponents themselves acknowledge, animal models are 'highly speculative' (Stein et al., , 1992, p 278). Furthermore, the animal model uses the similar phenomenology of compulsive washing and compulsive acral lick in dogs to posit a similar origin for the problem. Not only is this foolhardy (the same symptom can arise for many different reasons e.g. endogenous and reactive depressions, stereotypical behaviours), but the phenomenology is far more dissimilar to animal behaviour than it is similar. Compulsive checking behaviour does not have an animal equivalent provided by the researchers and, critically, the role of thoughts in generating the compulsions is not addressed by the model. There is no animal version of ruminations, a core feature of OCD and patients report that the compulsions serve a purpose and arise from the unwanted intrusive thoughts. Aside from the general difficulties in using animal models to investigate phenonema which may be, in part, social constructions (Hallam, 1985), it would require much ingenuity to test

the occurrence of unwanted intrusive thoughts in animals.

The use of animal models of OCD has been taken to an extreme, as illustrated by this serious (!) article entitled 'Mind the Dog' that recently appeared in the Sunday Times (March 1995).

'Obsessive behaviour - such as constant hand washing or irrational checking of light switches before leaving the house - has long been recognised in humans. But most pet owners do not realise that obsession is common in animals as well.

According to John Fisher, a pet behaviour counsellor based in Surrey, obsessive compulsive disorder (OCD) is especially common in dogs, and certain breeds are more vulnerable than others. Bull terriers chase their tails, Doberman pinchers like sucking their flanks, bearded collies are prone to spinning, and rottweilers and collies can become addicted to shadow chasing.

Such behaviour releases endorphins - chemicals that produce a feeling of pleasure - so that the actions become self-rewarding. Animals can become so obsessed in their behaviour patterns that they exhaust or even mutilate themselves.

Fisher has just treated Sherlock Holmes, a five-month-old German shepherd, who started chasing his tail about three weeks ago. Because his owners initially found the movement amusing, Sherlock Holmes's behaviour began as a device to seek attention. However, Sherlock Holmes has begun not only to chase his tail constantly, but is also deliberately hitting his head against objects. If his owners try to restrain him, Sherlock Holmes begins growling and displaying aggressive behaviour.

'The initial reward comes from gaining attention, but soon the chemical effects are self-rewarding,' says Fisher. 'OCD often indicates an unstimulated environment or is a result of stress or medically -related problems.'

To combat the problem, Fisher advises pet owners to find out if their breed of dog is predisposed to OCD and then to watch closely for signals. When the animal begins to display such behaviour, usually at an early age, owners should not react in any way. The best cure is to quietly remove the dog to another room for five minutes. This is not a form of punishment, but rather to illustrate to the pet that social isolation is a consequence of that action.

Cats need different handling. They usually display a more introverted form of OCD such as over-grooming or tail licking, which can lead to alarming self-mutilation. OCD in cats indicates a high level of insecurity. Owners should organise a routine around the cat - feeding times, playing time - so that it feels more secure.

If the behaviour continues, the animal should be referred to a pet behaviour counsellor. It will then be put on a combination of drug support and behaviour therapy. Fisher says: 'If the animal were merely on drug support, it may suppress the chemical rush it gets from its behaviour. However, OCD usually means something is wrong with the environment the animal is in.'

Fisher has also developed sound therapy to deal with OCD. He uses a training disc, an object that creates a noise when dropped. 'When an owner scolds a dog, that in itself is a form of gaining attention,' he says. 'If he or she ignores the dog, it may continue to be obsessive because of the endorphin release. My method involves placing food in front of the dog, then dropping the discs, and lifting the food out of the way. Soon the animal realises that the discs are a prelude to not getting a reward. It learns to walk away from the sound, and sit by its owner quietly.'

OCD is a condition that is best dealt with in its early stages. If your pet seems to be developing these symptoms, try these methods. But OCD can be a symptom of the problem

in your household, as much as a problem in itself.'

The `disorder' in this pet is clearly not equivalent to OCD in humans for a variety of reasons, but primarily because OCD causes distress - tail chasing to release endorphins does not. The extreme silliness of the article exemplifies the danger of losing sight of the immense anxiety and fear experienced by people with OCD.

7.4.8. Serotonergic mechanisms

The evidence used to support the serotonergic dysfunction hypothesis of OCD is also used to support the basal ganglia hypothesis. This hypothesis is based on the efficacy of selective serotonin re-uptake inhibitors (SSRIs), especially clomipramine (CMI) in the treatment of OCD (see Abel, 1993, and Jenike, 1992, for reviews). It was hypothesised that OCD may be caused by a dysfunction in the serotonergic system of patients. Since the basal ganglia are rich in serotonergic synapses (Rapoport and Wise, 1988), it is possible that the serotonergic mechanism which governs the firing of the action pattern in the striatal system is oversensitive in some patients with obsessive-compulsive disorder. Alternatively, in Baxter's model, the serotonergic dysfunction could occur in regulating the 'control' mechanism of the limbic system or in the striatum affecting gating and screening of stimuli.

Although initial clinical trials were poor methodologically and were open trials without appropriate placebo controls (e.g. Marshall, 1971), the efficacy of treatment with clomipramine has been shown in several studies which have used double-blind placebo controls (e.g. Zohar and Insel, 1987; Clomipramine Collaborative Study Group, 1991; De Veaugh-Geiss, 1994). Sample sizes, however, are generally small with often fewer than 20 patients in a group. The serotonergic hypothesis was advanced by a study of Zohar and colleagues (1988) who gave nine OCD patients m-chlorophenylpiperazine (mCPP; a

serotonergic agonist) before and after long term treatment with CMI. Although mCPP increased OCD symptoms and anxiety in patients before CMI treatment, after prolonged CMI treatment, mCPP did not increase OCD symptoms. The authors proposed that OCD patients have a hyperactive serotonergic system and that long-term CMI treatment may downregulate the serotonergic system. Studies using other serotonin selective re-uptake inhibitors such as fluoxamine, have been found to be superior to placebo in alleviating symptoms of OCD (Price et al., 1987; Goodman et al., 1989.) and as effective as CMI (Pigott et al., 1990). A recent meta-analysis confirmed the efficacy of pharmacological treatment in OCD and found that SSRIs were more effective in alleviating OCD symptoms than anti-depressant drugs with no selective serotonergic properties (Piccinelli et al., 1995)

There are several difficulties facing the serotonergic hypothesis of OCD, not least of which is that the evidence cited in support of the theory is the evidence that was in fact used to formulate it, namely the efficacy of drug treatment. In addition, the assumption is that because interference with the serotonergic system alleviates some of the symptoms of OCD, the serotonergic system must be **causing** those symptoms. One of the first rules of psychology is that function cannot be inferred from dysfunction without the presence of a double dissociation which means, in this case, that not only would OCD patients have dysfunctional serotonergic systems, but that normal and other psychiatric patients would have 'normal' serotonergic functioning that would not be helped by administration of selective serotonin re-uptake inhibitors. As Rapoport herself acknowledges 'the relationship between the cause of a disease and its treatment is not straightforward... ...Mutatis mutatum' (p.341, Rapoport, 1989). In fact, serotonergic fever is sweeping the psychiatric literature and dysfunctional serotonergic systems have been found in disorders of bulimia nervosa (Fluoxetine bulimia nervosa collaborative group, 1992), anorexia nervosa (Kaye et al., 1991), pain (Sternbach et

al., 1976) and schizotypal and borderline personality disorder (Markovitz et al., 1991). CMI was first introduced for the treatment of depression and, although CMI is considered to be specifically anti-obsessional, close examination of the findings in the literature still leaves open the possibility that the mechanism for the effectiveness of CMI stems from its efficacy in treating depression (Rachman, 1993, personal communication).

Another difficulty for the hypothesis is the finding that a highly selective serotonergic drug, sertraline did not result in a significant improvement in obsessive-compulsive symptoms (Jenike et al., 1992). An additional problem is that relapse after stopping CMI is immediate and there is a rebound effect (see Abel, 1993), which is not predicted by Zohar's down-regulatory hypothesis of serotonergic drug efficacy. Important, also, is that not all OCD patients improve with the administration of CMI; several of the patients in the Pigott study (1990) who did not improve with CMI improved with fluoxetine and vice versa. The current hypothesis could not explain this and neither could it account for the patients who fail to respond to either type of drug treatment. The efficacy of the drug is limited, with the improvement ranging from 50-75% and the drug is reported to 'take the edge off the obsessional symptoms' rather than provide a cure whereby the intrusive thoughts and compulsive behaviour do not occur at all (see Abel, 1993). Also, there is no dose-dependent relationship, i.e., an increase in the dose is not followed by a proportional increase in improvement of symptoms. Lastly, serotonin challenge tests have demonstrated that the serotonergic system in OCD patients is functional (Barr et al., 1992), which theorists suggesting a dysfunctional serotonergic system as the primary cause of obsessive-compulsive behaviour will find difficult to explain.

Although the data supporting the serotonergic system are consistent with the basal ganglia hypotheses, the hypotheses were made after the efficacy of the serotonin selective

reuptake inhibitors were known. Data used to construct a theory cannot be used to later support it. In addition, the problems with the serotonergic model also apply to the basal ganglia theories.

7.4.9. Comment on Basal Ganglia Deficit Model

A wide variety of evidence appears to support the basal ganglia deficit model of OCD. The general consensus amongst clinicians both in the USA and increasingly in the U.K. is that the disorder is 'biological'. For example, Chris Freeman, an advocate of cognitive-behavioural therapy for the treatment of eating disorders, regards OCD to be a disorder of biology (Freeman; personal communication, 1994). The implication is that it is of no interest to psychologists, and that psychological therapies can only work by changing brain structure and functioning. However, a close examination of the evidence indicates that the logic behind many assumptions, most notably with regard to the efficacy of serotonin reuptake inhibitors, is flawed. Also, the neurological deficit theory is not stated in a way that opens it to potential disconfirmation, it is untestable in many respects and often vague and non-specific. Nevertheless, as a whole, the evidence appears voluminous and converging towards a consensus of neurological impairment.

7.5. The Basal Ganglia Deficit Model and the Heterogeneity Hypothesis

The evidence for the basal ganglia deficit model is not predicted or addressed by the C-B model. Similarly, the basal ganglia model does not place critical importance on the role of anxiety or on the subjective experience of obsessions. It does not address the central role of resistance in obsessive-compulsive phenomena, and it cannot begin to account for the success of behavioural therapy, much less the changes in brain functioning observed with

behavioural therapy (McGuire et al., 1994). Critically, the basal ganglia model reduces OCD to mere motor phenomena and it fails to take account of the 'O' in OCD. If these models were merely different levels of explanation, they might co-exist side by side. However, the fundamental assumptions underlying the C-B model and basal ganglia deficit model are very different. The former considers OCD to be a psychological phenomenon subject to the same influences as in the normal population, mediated by its neurological substrate. The basal ganglia deficit model considers the disorder to be one of disease, qualitatively different from that of the normal population. The intrusive thoughts, anxiety, guilt and perceived responsibility for threat that comprise the C-B model are not addressed by the basal ganglia model, nor are the neurological soft signs, neuroimaging and other studies addressed by cognitive-behaviourists.

A simple solution is that one model is suitable for some people, and the other model is suitable for others. In other words that some people will show anxiety, excessive responsibility and guilt, whilst others will have a high number of neurological soft signs and neuropsychological deficits. This hypothesis is tested in chapter 10.

The following section describes a study to generate data to test the hypothesis by examining NSS in people with OCD.

7.6. A Study of Neurological Soft Signs in OCD

7.6.1. Aims

The aims of the study were to:

1 Provide data to test the heterogeneity hypothesis

2 To investigate NSS in people with OCD

7.6.2. Background

Neurological soft signs have been found in people with a variety of psychiatric disorders, notably schizophrenia (see earlier for a review of the literature). It is a matter for debate as to whether these NSS have any localising function (Heinrichs and Buchanan, 1988) but they are regarded, to an extent, as the poor man's PET scanner! In summary, there is some evidence to show that OCD patients have an increased number of neurological soft signs compared to healthy controls (Hollander et al., 1990). This group has also found that 8 OCD patients with high soft sign scores had significantly increased ventricular volumes compared with 8 OCD patients with low soft sign scores and 8 non-psychiatric control subjects; caudate and ventricular nucleus volumes did not differ between groups.

In summary, an individual with dysfunctional basal ganglia would be expected to show abnormal neurological soft signs, particularly in areas of sensory integration and fine motor movement. Since these signs are subtle, the assessment used for determining NSS is important. Quitkin and colleagues (1986) based their assessment on the work of Hertzig and Birch, which was communicated to them personally. Their assessment comprised a standard neurological investigation to determine the presence of 'hard' neurological signs and a soft signs assessment. Included in the latter assessment was an examination of mirror movements, speech, right-left confusion, adventitious overflow, finger-to-thumb opposition, finger-to-thumb mirror movements, pronation-supination, left and right foot taps and a face-hand test. Quitkin's assessment was used as the basis for other studies, some of which used 10 items (King et al., 91), and others 12 (Kolokowska et al., 85). The soft signs assessment battery of Shaffer and colleagues (1985) is not specified although abnormalities were reported on tests of finger-nose testing, finger pursuit and complex fine motor activities (dysdiadochokinesis,

i.e., the inability to perform rapid alternating movement of hands and feet in a smooth, fluent and rhythmic fashion; dysphraphesthesia, i.e., the inability to detect predisplayed symbols traced on the palmar surface when blindfolded; and asterognosis, i.e., the incorrect identification of three-dimensional objects in an outstretched hand when blindfolded). This assessment was conducted on children. The assessment of childhood neurological soft signs by Denckla (Denckla et al., 1988) was similar to that of Shaffer, and reliability studies were conducted on the NESS (Vitiello et al., 1989)

The battery used by Hollander and colleagues (1990) involved 20 individual tasks which were associated with one of four categories - fine motor co-ordination, involuntary movements, sensory function and visuo-spatial tasks. The battery was based on that of Quitkin and Denckla and was expanded to include visuo-spatial tasks. Hollander interprets his results as suggesting 'for case finding, a cutoff of three [soft signs] is best, whereas if high specificity is needed, as with biological studies, a cutoff of five is best'. This suggestion and its associated clinical implications is only possible to apply in practice if the neurological soft signs assessment is standardised and used consistently, as increasing the number of tasks would increase the detection of neurological soft signs. Although Hollander did not publish the inventory used to assess soft neurological signs, Schroder's 17 item inventory went some way towards establishing a standardised measure. Recent work by Chen and colleagues has provided an assessment measure which is standardised, complements the basic neurological examination, facilitates further neurological assessment and could be administered routinely in a clinical setting. The paper details the development of the inventory which was based on previous published work.

The primary purpose of the present study was to generate data to test the heterogeneity hypothesis. However, the study is also of intrinsic value since neurological soft

signs have not been assessed in OCD patients by means of a standardised instrument such as the Cambridge Neurological Inventory (CNI), or in patients who were recruited from the community. It is also the first time that NSS have been examined in obsessional patients from England who do not specifically have obsessional slowness.

7.6.3. Method

Subjects

24 subjects with OCD were included in this study, 11 male and 13 female. The mean age of the sample was 37 years, 2 months (sd 9.3; range 23 - 70 years). The 24 subjects were taken from the larger sample of 46 people who agreed to attend an appointment at the Institute of Psychiatry (see chapters 3 and 5). Subjects were selected if their appointments were at a time when the Neurologist was available to conduct the NSS examination. There were no significant differences in age or severity of the OCD (as measured by the Maudsley Obsessive-compulsive Inventory - MOCI), between the 24 subjects who were given the examination and the 22 subjects who were not (t-test for independent means: $t=1.29$, $p>0.05$; $n=24$ in group 1, $n=21$ in group 2). All the subjects met DSM III - R criteria for OCD. Duration of the illness ranged from 1 year to 40 years (mean duration was 17 years). The average age of onset was 20 years (median age of onset 17 years). The subjects were not asked to be medication-free for the purposes of the examination. Eleven subjects were known to be on medication at the time of the study and 9 were undergoing psychological treatment.

Results from this group were compared with data published for groups of people with no psychiatric symptoms and with schizophrenia (Chen et al., 1995)

Measures

The Cambridge Neurological Inventory

The inventory takes approximately 30 to 45 minutes to administer and must be administered by a neurology specialist (personal communication, Hymas 1992). The categories into which the signs are classified and the individual tasks of which they are composed are detailed below:-

'Hard' Neurological Signs: Plantar reflexes, power and reflexes in extremities.

Motor Coordination: Finger-nose test, finger-thumb tapping, finger-thumb opposition, dysdidochokinesia, fist-edge-palm test, Oseresky test.

Sensory Integration: extinction, finger agnosia, stereoagnosia, agraphesthesia, left-right orientation.

Primitive reflexes: snout reflex, grasp reflex, palmo-mental reflex.

Tardive dyskinesia: simple, complex and dyskinetic abnormal involuntary movements in the face, trunk and limbs

Catatonic signs: gait mannerism, gegenhalten (resistance to passive movement which increases with the force exerted), mitghehen (`Anglepoise lamp' raising of arm in response to light pressure), imposed posture, abrupt and/or exaggerated spontaneous movements, iterative movements, automatic obedience and echopraxia.

Parkinsonism: increased tone in limbs, decreased associated movements in walking, shuffling gait, arm dropping, tremor, rigidity in neck.

Failure to suppress inappropriate response: Blinking in saccadic eye movement; head movement in saccadic eye movements; winking with one eye.

Ratings on the CNI are standardised to indicate normal response (0), equivocal response

(0.5), abnormal response (1) or grossly abnormal response (2). Signs were categorised according to Chen et al., (1995).

Procedure

Eighteen subjects were administered the Cambridge Neurological Inventory by B.G., a Consultant Neurologist. Six of these examinations were video-taped. The remaining six subjects were administered the CNI by A.L., also a Consultant Neurologist. The neurologists were not blind to the diagnosis of OCD.

7.6.4. Results

In order to compare across groups, before any analyses were conducted, the samples were tested for heterogeneity of variance. If this test was significant, Scatterthwaite's approximation was used. The Mann-Whitney-U test was not used, as such an analysis would have required the raw data from the schizophrenic and normal groups in order to make a comparison across groups.

There were no significant differences in the total number of NSS in the patients seen by the two different Neurologists (total=14.083 for AL; total=13.444 for BG; Chi-squared (1,19)=4.33, p>0.05).

The mean number of NSS was 13.6. The results can be seen in Table 7.1.

Table 7.1. NSS in OCD: comparison with schizophrenic and normal data

Sub-group	OCD (n=24)		SCHIZOS (n=62)		NORMALS (n=100)	
	Mean	(s.d)	Mean	(s.d)	Mean	(s.d)
TOTAL *s*n	13.60	(6.6)	18.91	(10.78)	4.56	(3.92)
Hard signs *s	0.21	(0.59)	0.57	(0.94)	0.35	(0.79)
Motor co-ordination *n	3.75	(4.09)	5.23	(3.96)	0.84	(1.41)
Sensory integration *n	4.6	(2.02)	5.03	(4.10)	1.61	(1.87)
Primitive reflexes *n	0.58	(0.83)	0.38	(0.66)	0.01	(0.10)
Tardive dyskinesia *s	0.17	(0.38)	0.78	(1.03)	0.02	(0.09)
Catatonic signs *s	0.02	(0.1)	0.77	(1.09)	0.04	(0.14)
Extrapyramidal signs *s*n	0.4	(0.51)	1.49	(1.65)	0.07	(0.27)
Failure of suppression *n	0.83	(1.07)	1.58	(1.54)	0.37	(0.75)

*n = sig difference between OCD and normals

*s = sig difference between OCD and schizophrenics

The mean age of the Chen's patients was 41.36 yrs (sd=14.15) and the mean age of the control group was 40.17 years. 66% of each group were male.

There was a significant difference between the total scores on the CNI for normals and OCD subjects (t=8.39 , p<0.01). There was a significant difference between the total score on the CNI for schizophrenics and OCD subjects (t=-2.25, p < 0.05). OCD Ss show significant differences from normals (p<0.05) on all sub-sets of signs except for hard signs, tardive dyskinesia and catatonic signs (p>0.05). In the comparison with schizophrenics, there is a significant difference between schizophrenics and OCD for all subgroups of signs, except motor co- ordination, primitive reflexes, sensory integration and failure of suppression (p>0.05).

There was no significant difference between the number of NSS of subjects on medication (n=11) and subjects who were not on medication (n=13) **(t=0.19, p>0.05).**

7.6.5. Discussion

This study showed that OCD subjects had abnormal soft signs, particularly in sensory integration and motor co-ordination. These findings are in keeping with those of Hollander et al., (1990), although the nomenclature is slightly different. Hollander found that OCD patients had abnormalities in fine motor co-ordination, involuntary and mirror movements (sensory integration) and visuo-spatial function (considered as sensory integration by the CNI). It is important to note that the deficits of the schizophrenic group are also in the area of motor co-ordination and sensory integration (see Heinrichs and Buchanan, 1988 for a review). Specifically, the majority of the more comprehensive studies examining NSS have found abnormalities in the area of integrative sensory function and in the area of motor co-ordination.

The results could indicate that abnormal NSS in the area of sensory integration and motor function are associated with the presence of <u>any</u> psychiatric disturbance. However, in their comprehensive review, Heinrichs and Buchanan (1988) conclude that 'the preponderance of data suggest that schizophrenic patients have more neurological abnormalities than patients with mixed psychiatric disorders and affective disorders'. The studies reviewed did not, however, include the research on NSS in OCD patients, nor the study of Shaffer and colleagues (1986) in which NSS at age 7 predicted later psychiatric disturbance characterised by anxiety, withdrawal and depression - not psychoses. Furthermore, the results are in keeping with those of Nasrallah et al., (1983,) in which there were no significant differences between schizophrenic and bipolar patients, although there was more impairment in the former.

Our study found that OCD patients had abnormal soft signs. This is in keeping with the basal ganglia hypothesis, although it is generally accepted that, unlike 'hard' signs, they do

not have a localization function. Furthermore it is possible that NSS are non-specific and would be found in the majority of psychiatric disorders. There is a need for investigation of NSS in other psychiatric populations, particularly in those with anxiety disorders.

These results should be interpreted with caution. Firstly, although a standardised instrument was used to assess NSS in the normal, schizophrenic and OCD samples, the examinations were conducted by different neurologists for whom inter-rater reliability could not be established. The neurologists were not kept blind to the diagnosis and the examinations were also carried out at different locations. Secondly, the groups were not matched for age, sex and intelligence and there is some evidence to show that NSS are associated with intelligence (Shaffer et al., 1985; Schoenfeld et al., 1989).

In summary, the findings of this study are in keeping with those of Hollander and with the basal ganglia hypothesis but must be regarded with caution. Future research should examine NSS in patients with other psychiatric conditions, particularly anxiety.

7.7. Summary

This chapter set out the basic assumptions of the neurological deficit model of OCD. Particular attention was paid to describing the basal ganglia deficit model of OCD proposed by the NIMH group. Evidence from a variety of sources - neuroimaging, neurological soft signs, neuropsychological tests, brain lesions, associations with known basal ganglia disorders and the efficacy of serotonin re-uptake inhibitors- was critically reviewed. It was concluded that much of the evidence is flawed, but that it converges to form coherent support for the model. The relevance of the model to the heterogeneity hypothesis was examined. A study is reported which aimed to 1) generate data to test this hypothesis (see chapter 9and 2) to examine NSS in people with OCD. People with OCD had more NSS than published data for

people without OCD, but fewer signs than people with schizophrenia. Like those with schizophrenia, the primary difference was a high number of NSS in motor co-ordination and sensory integration, both of which are served by the basal ganglia. It was suggested that such deficits are not specific to any particular psychiatric group, and that future research should examine NSS in people with anxiety disorders.

CHAPTER 8

Neuropsychological Aspects of OCD

8.1. Introduction

Neuropsychology is concerned with the behavioural correlates of altered brain function (Grand and Reed, 1988). Neuropsychological assessment consists of a careful evaluation of 'those behaviors and abilities that tend to become disrupted or altered in the presence of brain **disease**' (p.122; Grand and Reed, 1988; emphasis added). Such tests have been widely used to determine possible cognitive deficits in people with OCD. Although neuropsychological tests of OCD have examined the role of memory (e.g. Malloy, 1987), the role of memory in OCD will not be discussed in this chapter for two reasons. Firstly, there is a need to be focused owing to time and space limitations. Secondly, assessments of memory are not needed to test the heterogeneity hypothesis described in chapter 9. Many of the neuropsychological investigations of OCD have assessed visuo-spatial functioning and the functioning of the frontal lobe (in particular with regard to set-shifting ability). This chapter therefore concentrates on studies in these areas.

This chapter starts by reviewing the literature on neuropsychological aspects of OCD. The purpose of neuropsychological testing is discussed within this section. The literature on neuropsychological test performance in OCD is examined and summarised briefly. The relevance of neuropsychological tests to the heterogeneity hypothesis is discussed before we go on to describe a study of neuropsychological aspects of OCD, the primary aim of which was to generate data to test the heterogeneity hypothesis. The chapter concludes by emphasizing the need for control groups in order to place any neuropsychological deficits in context.

8.2. Review of neuropsychological aspects of OCD

8.2.1. What neuropsychological tests CAN'T tell us

Researchers differ in their understanding of the purpose of neuropsychological testing. For example, Cox et al. (1989) regard neuropsychological tests as a useful tool in the search for 'a new biological factor in obsessive-compulsive disorder (OCD)' (chapter 5, p.73). Hollander et al. (1991) report that neuropsychological tests were presumed 'to reflect functions mediated by particular cortical regions, and deficit performance was presumed to reflect focal cortical dysfunction' (Hollander et al., 1991, p.131). Whilst noting 'several limitations to this kind of attempt to localise neuropsychological deficits using neuropsychological tests', Stein et al. (1994) agree that 'tests of set-shifting ability reflect frontal lobe function'. (p.170). Christensen et al. make the same assumption that 'from a neuropsychological perspective, the findings of specific cognitive deficits lead to consideration of possible neuroanatomic correlates' (Christensen et al. 1992, p.15). Visuo-spatial deficits are considered to reflect either right hemisphere dysfunction or dysfunction of the basal ganglia.

However, Otto et al. (1990) caution against the use of neuropsychological investigation as a 'lesion detector', as it is not straightforward to determine function from dysfunction. A double dissociation is required. He emphasizes that 'interpretations of cognitive deficits as a neural pathology must be made with caution in this disorder that so clearly affects cognition and emotion'. (Otto, 1992) p.830. He warns that:

1 Neuropsychological tests cannot differentiate between certain basal ganglia and frontal lobe dysfunctions.

2 The absence of performance deficits on tasks sensitive to frontal lobe or basal ganglia dysfunction does not rule out basal ganglia involvement or frontal involvement in OCD.

3 Cognitive deficits may be secondary to the disorder rather than representing a causal or maintaining factor. For example, an increase in latency may result from obsessional thoughts interfering in a task. Alternatively, obsessional subjects may adopt a maladaptive strategy for example, checking task performance to make sure it is 'right'.

Each of these warnings is important to remember whilst reviewing the literature. The first statement arises from criticisms of those who use tests as 'lesion detectors'. People who assume a 1:1 connection between neuropsychological test performance and the locality of a lesion are following the logic below:-

1. Everyone who has a discrete lesion in (Y) does poorly on a particular test (X).

2. Good performance on (X) means that (Y) is intact and functional.

3. Poor performance on (X) means that (Y) is damaged.

There are obvious problems with this logic.

It seems as though Otto's first warning stems from the observation that assumption (3) is illogical. It is perfectly possible for the frontal lobe to be intact and yet for one to do poorly on neuropsychological tests owing to other factors such as slowness, intelligence,

anxiety, or lesions in other areas of the brain (although these factors may share a common neurological 'cause' with the deficit in question). Matched control groups are essential to isolate the specific factor that may be associated with neuropsychological test performance. For example, an athlete may fail to win a race because he has a broken leg. It may be reasonable to infer that to win a race, an intact leg is needed. However, an athlete may fail to win a race because he has a stomach upset, a headache or has girlfriend troubles on his mind! It is not reasonable to infer that all those who fail to win a race have broken legs. It is not even reasonable to infer that all those who fail to complete the race at all have broken legs. There could be many reasons for failing to win - physical and psychological. Winning a race is therefore not a direct reflection of whether legs are broken or not, and by the same logic, neuropsychological test performance is not a direct reflection of whether frontal lobes are damaged. In addition, poor performance on the tests may reflect damage that is secondary to the functioning of the frontal lobe (such as damage to the fronto-striatal loop) and may not reflect frontal lobe damage directly. This can be seen in the example of E. Miller (1979; cited in Lezak, 1983):

> 'It is tempting to conclude that, if by removing a particular part of the brain we can produce a deficit in behaviour, e.g., a difficulty in verbal learning following removal of the left temporal lobe in man, then that part of the brain must be responsible for the impaired function....[T]his conclusion does not necessarily follow from the evidence as can be seen by the following analogy. If we were to remove the fuel tank from a car, we would not be surprised to find that the car was incapable of moving itself forward. Nevertheless, it would be very misleading to infer that the function of the fuel tank is to propel the car' (pp19-20).

Therefore, not only does poor performance on these tests fail to discriminate between cortical lesions, it also fails to discriminate between cortical lesions and psychological processes that may be important in the disorder. Furthermore, it does not inform us directly about the function of cortical regions.

Otto's second warning may stem from the specificity and accuracy of neuropsychological tests. For example, the best that can be said of the Trail Making Test is that 'the test is sensitive to the presence of brain damage' (Aronowitz et al. 1994). One is forced to wonder about the utility of including such a test amid a lengthy battery. A patient with OCD may show no deficit on a test designed to assess planning abilities (which require the frontal lobe) and yet may still have a deficit in the ability to shift sets. Alternatively, despite their face validity, the tests may lack construct validity. For example, Milner (1963) interpreted poor performance on the Wisconsin Card Sorting Test (WCST; Milner, 1963) in terms of a failure of the inhibition of central sets . However, it has recently been suggested that other factors such as the salience of the stimulus situation and the propensity to guess may be important (Burgess and Shallice, 1994a). Therefore, a person may do well on a task but it may not mean that cortical dysfunction is absent.

The third warning - that neuropsychological tests cannot tell us about the direction of causality is often forgotten, and it is often implicit in the literature that poor performance on a neuropsychological test not only reflects cortical damage but it is that cortical damage that CAUSES OCD. However, it is perfectly possible that having OCD may :

(1) cause a dysfunction in a cortical region e.g. by excessive anxiety

(2) impair performance owing to depression which increases slowness

(3) impair performance owing to the effect of drugs

(4) cause a poor neuropsychological test performance, irrespective of the involvement in

any particular brain region

8.2.2. What neuropsychological tests CAN tell us

Otto suggests that neuropsychological assessment studies can help identify the cognitive strengths and weaknesses associated with the disorder and emphasizes the utility of neuropsychological investigations as a 'neurobehavioural descriptor of functional strengths and weaknesses' (Otto et al. 1990, p.133). When used properly, neuropsychological assessments can be a useful clinical tool indicating the specific deficits of an individual. Lezak (1983) believes that 'A competent practitioner [in neuropsychological assessments] must have the interviewing and counselling skills, the appreciation of social and cultural variables, and the psychodiagnostic acumen of a clinical psychologist; the statistical sophistication and test familiarity of a psychometrician; and a fairly comprehensive understanding of the human nervous system and its pathologies, at least at a level comparable to that of a general practitioner' (p.4).

Providing that the practitioner is competent and the neuropsychological examination is not conducted or interpreted in a vacuum, neuropsychological assessments can help in diagnosis (e.g., in distinguishing between different neurological conditions), patient care (e.g., the extent to which medications enhance or compromise a patient's mental efficiency) and research (e.g., to study the organisation of brain activity and its translation into behaviour, and in investigations of specific brain disorders and behavioural disabilities).

8.2.3. The Literature

Good reviews of the neuropsychological investigations into OCD are provided by Otto (1992), Stein et al., (1994) and Alarcon et al., (1994) and are summarised in Table 8.1. A

description of the tests mentioned in the table can be found in a compendium of neuropsychological assessment (Lezak, 1983) and therefore will not be described in detail in this section.

Stein's review concluded that 'Overall, there has been some agreement between different studies, but the implications on specific neuropsychological tests in OCD are not readily interpretable' (Stein et al., 1994. p.173). Evidence of executive dysfunction in patients with OCD has been found in 5 studies, 5 studies failed to find evidence of frontal lobe dysfunction, and the remainding studies found evidence for frontal lobe dysfunction in some of their tests but not others (see Table 8.1 for more details). The evidence for basal ganglia/right hemisphere dysfunction (based on deficits in visuo-spatial ability) is more consistent, although differences are found between studies (see Table 8.1).

To the best of my knowledge, only one study (Harvey et al., 1987) has reported a relationship between clinical variables (the Leyton Obsessional Inventory) and neuropsychological test performance. In the other studies, either no association was found (e.g. Boone et al., 1991; Zielinksi et. al., 1991), or else associations are not reported (e.g. Hollander, 1990; Christensen et al. 1991). It is surprising that the presence/absence of such associations are not commented on, since the meaning and utility of neuropsychological assessments are surely dependent on a relationship between clinical indices and the assessment index. The lack of a relationship between clinical indices of OCD and neuropsychological test performance raises questions about the usefulness of such assessments and indicates that neuropsychological deficits may not be specific to OCD but may be the results of a more general factor such as anxiety or neuroticism. The only study to include psychiatric controls (Cohen et al. 1995) found no difference in neuropsychological test performance between social phobics and OCD patients, supporting the suggestion that neuropsychological deficits

are not specific in OCD.

Table 8.1. A summary of the neuropsychological investigations to date

	Sample	Included those on drugs?	Cont-rols?	Tests administered included:-	Executive dysfun-ction	Visuo-spatial deficit	Comments
Flor-Henry et al. 1979	11 adult OCD	Yes	No	Wechsler Adult Intelligence Scale (WAIS)[1], Halstead-Reitan Battery,[2,3]*	Partial	Yes	The category test on the Halstead-Reitan was abnormal, but the one established measure of frontal lobe function in the WAIS (Verbal fluency) was normal.
Insel et al. 1983	18 adult OCD	Yes	No	Halstead-Reitan Battery[2.3]	No	Yes	No overall impairment on battery. Failed to replicate Flor-Henry (1979)
Behar et al. 1984	17 adolescents OCD and normal controls	Yes	Yes	Money's Road Map Test (MRM)[4], Stylus Maze Learning Task (SMLT)[5], Rey Osterreith Complex Figure Test (ROCFT)[6]	Yes	Partial	Impaired on SML (frontal/temporal lobe), MRM, both of which measure visuo-spatial and set-shifting. Some abnormal on ROCFT. Not impaired on measures of attention. Deficits did not correlate with ventricular: brain ratios on computerised tomography
Harvey et al. (1987)	19 adults OCD	Yes	No	Nelson's modified WCST[7,8]	Yes	N/A	Impairment correlated with scores on Leyton Obsessional Inventory
Malloy (1987)	11 adults OCD.	Yes	No	Luria Motor Tasks[9], Controlled Oral Word Association Test (COWA)[10], WCST[7], Wechsler Memory Scale (WMS)[11], Line Orientation Test (LOT)[12]	Yes	N/A	Only a subset of Ss showed frontal impairment
Diamond et al. (1988)	18 adult OCD.	Yes	No	ROCFT[6]	N/A	Yes	Test of visuoconstructional ability and incidental visual memory
Flor-Henry and Lind (1988)	28 unmedicated OCD; normal controls	No	No	Purdue Pegboard[13], Tactual Performance[2,3,14] Halstead Category[2,3], WCST[7]	Yes	N/A	
Rosen et al. (1988)	34 adult OCD, normal controls	Yes	Yes	Matching familiar figures test (MFFT)[15], Benton Visual Retention Test (BVRT)[16]. Trail Making Test (TMT)[17], Stroop[18], WAIS[1]	N/A	Yes	

	Sample	Included those on drugs?	Cont-rols?	Tests administered included:-	Executive dysfun-ction	Visuo-spatial deficit	Comments
Head et al. (1989)	15 unmedica ted OCD, 15 normal norntols	No	No	Nelson's WCST[8]. LOT[12], WAIS-R subtest (block design)[19], Word Fluency tests[20]. MRM[4], Semmes Personal Orientation test(SPOT)[21], SMLT[5].	Partial (impaired on WCST and MRM not SPOT or SMLT)	Partial (impaired on WAIS-R block design, not LOT	Difficulties in maintaining attention on relevant stimulus in the Stroop.
Cox et al. (1989)	42 adolescen t patients, normal controls	Yes	Yes	WCST[6], MRM[4] SMLT[5]	Partial	No?	Impaired on card sort but not on perseverative and non-perseverative errors on WCST.
Laplane et al. (1989)	8 OCD	Yes	No	WAIS-R verbal subscale[19], Raven's Progressive Matrices-short form[22], Wechsler Memory Scale[11], Nelson's WCST[8],Word Fluency tests[20], graphic series[9], ROCFT[6]	Yes	Yes	No formal statistical analyses were conducted. PET and nMRI scans showed basal ganglia lesions in patients
Hollander et al. (1990)	30 medicatio n free OCD	No	Yes?	MFFT[15], BVRT[16]	N/A	Partial (impaired on BVRT)	Number of neurological soft signs correlated with number of errors on BVRT not MFFT.
Martinot et al. (1990)	16 non depressed OCD, 8 normal controls	Yes	Yes	COWA[10], ROCFT[6], attentional tests and tests of mental control.	No	No	OCD Ss impaired on attentional tasks)
Boone et al. (1991)	20 non-depressed OCD; 16 matched controls	Yes	Yes	WAIS-R[19], WMS[11], WCST[6], Stroop[18], Auditory Consonant Trigrams[23], COWA[10], Design Fluency[24], Hooper Visual Organisation Test[25], Rey Tangled Lines[26] and ROCFT[6].	No	Yes	Patients with family history of OCD were more impaired than those without a family history.
Zielinksi et al. (1991)	21 adult OCD and normal controls	Yes	Yes	Raven's Progressive Matrices- Short Form[22]; Calıfornia Verbal Learning Test (CVLT)[27], Corsi's Block Tapping Test[28]; Recurring Figures Test[29], WCST[6], COWA[10], Design Fluency Test[24]	No	Yes	Impairment did not correlate with anxiety

	Sample	Included those on drugs?	Cont-rols?	Tests administered included:-	Executive dysfun-ction	Visuo-spatial deficit	Comments
Christense n et al. (1992)	18 non-depressed adults OCD, normal controls	Yes	Yes	WAIS-R subtests[19], WMS[11], Continuous Paired Association Booklet Category Test[30], Porteus Maze Test[31], WCST[6], COWA[10], Design Fluency[24], Purdue Pegboard[13]	No	Yes	No differences on tests of executive function (category test, COWA, design fluency, WCST or verbal fluency on WAIS)
Otto et al. (1992)	20 untreated OCD	Yes	No	Battery including ROCFT[6]	No	Yes (subgro-up)	Also found evidence of verbal memory deficits
Martin et al. (1993)	17 OCD, 11 Trichotill omania, 16 normal controls	Yes	No	WAIS-R[19], Money Road Map[4], Room Test[32], COWA[8], Reaction Time[32], Visual Search Task[33], California Verbal Learning Test[27]	No	No	Suggested only a subgroup of OCD have cognitive impairment
Aronowitz et al. (1994)	31 adult OCD; 22 normal sex-matchedc ontrols	yes	No	WAIS-R [19], BVRT[16], MFFT[15], TMT[17], Stroop Test[18]	Yes	Partial (impaired on BVRT and MFT, not block design)	Male patients particularly impaired compared to female.
Cohen et al. (1995)	65 OCD, 17 social phobic, 32 normal controls	Yes	No	WAIS-R subtests[19], BVRT[16], MFFT[15], TMT[17]	No	Yes	No difference in impairment between OCD and social phobics
Veale et al. (1995)	40 in-patients OCD, 22 normal controls	Yes	No	Set-shifting and Tower of London task in CANTAB (Cambridge Neuropsychological Test Automated Battery)[34]	Yes	N/A	Symptoms did not correlate with deficits

Among tests of executive function and visuo-spatial deficits, there is no single test on which people with OCD consistently perform worse than normal controls. Possible reasons for the inconsistencies in the findings between studies include the neuropsychological methodologies, the comprehensiveness of assessments, the small sample sizes and the lack of appropriate controls. The question of the validity of neuropsychological tests plagues the area - how do we know if we are measuring what we think we are? Most of the tests used require a variety of neurological systems for a good performance, not just the most obvious ones of executive functioning. For example, the WCST needs an ability to sort, to form concepts, and to shift sets amongst other abilities. Another reason for discrepancies between studies may be inconsistency in matching subjects in the control group. In some studies, subjects are matched to the probands on indices of age, sex and intelligence (e.g. Head et al. 1989), but in other studies , there were significant differences in IQ between subjects and controls (e.g. Boone et al. 1991). Another important factor that has been neglected in some studies is the role of speed in test performance. Some of the assessments are subject to constraints of time (e.g. Block Design) and it may be that an individual's natural speed is affecting test performance. Depression, medication, and anxiety may also influence test performance. It is important, therefore, to consider these other variables when comparing the neuropsychological test performance of controls and patients. A final reason for the inconsistency between studies is that OCD may be a heterogeneous disorder with homogeneous subgroups characterised by different neuropsychological abilities (see section 8.2).

8.2.4. Neuropsychological tests and the heterogeneity hypothesis

'Thus, to date, there have been no common impairments exhibited by all OCD subjects on neuropsychological or cognitive assessments... OCD may be a heterogeneous disorder characterized by various homogeneous subgroups' (Aronowitz et al. 1994). The lack of any consistent neuropsychological impairment both between studies (eg Flor-Henry et al, 1979; Insel et al. 1983) and within studies (e.g. impairments were found only in a subgroup of patients in the study by Otto, 1992; Head et al., 1989) found deficits on the SPOT assessment of 'frontal lobe function' but not the SMLT) has given rise to the suggestion that OCD is a heterogeneous disorder. Different authors have different suggestions as to the homogeneous sub-groups that may characterise this 'notoriously heterogeneous group' (Head et al. 1989, p. 936) and further discussion of this can be found in chapter 9.

It is possible, therefore, that some OCD patients have neuropsychological deficits, whilst others do not. If some patients have the basal ganglia/frontal lobe dysfunction suggested (Rapoport and Wise, 1989), they will show a deficit on assessments of visuo-spatial and set-shifting abilities. If others do not show a basal ganglia/frontal lobe dysfunction, they may be more likely to show features of anxiety, guilt and responsibility in accordance with the cognitive-behavioural hypothesis. The test of this hypothesis of heterogeneity is detailed in chapter 9.

8.3. A study of neuropsychological aspects of OCD

8.3.1. Background

Neuropsychological tests can help identify the cognitive strengths and weaknesses associated with disorders. A variety of studies have attempted to assess the neuropsychological features of people with OCD (Head et al., 1989; Martinot et al. 1990;

Boone et al., 1991; Zielinski et al., 1991 and Christenson et al., 1992) (see Table 8.1). The majority of studies have demonstrated that people with OCD have a deficit in tasks designed to assess visuo-spatial abilities. Although they cannot act as specific 'lesion detectors' poor performance on tasks of visuo-spatial abilities have been considered to reflect basal ganglia dysfunction or right hemisphere dysfunction (Flor-Henry et al. 1979; Stein et. al. 1994).

People with frontal lobe lesions have a deficit in tasks of verbal fluency and set-shifting abilities (Milner, 1964), and poor performance on tasks designed to assess such abilities is assumed to reflect a frontal lobe dysfunction. Making that assumption, there is inconsistent evidence that OCD is characterised by a deficit in `frontal abilities (see Table 8.1). Part of the reason for the inconsistency may be that factors such as speed, intelligence and anxiety have not always been considered but may influence performance.

The utility of neuropsychological assessments in elucidating the cognitive strengths and weaknesses associated with OCD is dependent upon a relationship between clinical indices of OCD and neuropsychological test performance. However, only Harvey (1987) has found an association between OCD symptom severity and neuropsychological impairments, implying that any impairment may not be specific to OCD or that the deficit is not secondary to the symptoms.

In this study, performance on tests of both visuo-spatial and frontal abilities was assessed in patients with OCD and normal controls, although greater emphasis was placed on assessing frontal abilities, given the greater controversies in the literature. Two new tests were included (the Brixton and the Hayling-Burgess and Shallice, 1994a and b), and the study took account of the effect of speed, IQ and anxiety on test performance.

8.3.2. Aims

There were three aims in the present study:

1) To test the hypothesis that people with OCD have a deficit in visuo-spatial and set-shifting abilities relative to normal controls using old and new tests.

2) To investigate the relationship between neuropsychological impairments (if any) and symptom severity.

3) To provide data to test the heterogeneity hypothesis (see chapter 9).

The following describes data relating to the first two aims of the study. The heterogeneity hypothesis is tested, in part, using data from this study and is described in chapter 9.

8.3.3. Hypotheses and Predictions

Hypothesis 1

(Controlling for the effects of speed, intelligence and anxiety) People with OCD have a deficit in visuo-spatial abilities, relative to normal controls.

Prediction 1

(Controlling for the effects of speed, intelligence and anxiety) OCD subjects score significantly lower than normal controls on tests designed to assess visuo-spatial abilities.

Hypothesis 2

(Controlling for the effects of speed, intelligence and anxiety), People with OCD have a deficit in executive function relative to normal controls.

Prediction 2

(Controlling for the effects of speed, intelligence and anxiety), OCD subjects score significantly lower than normal controls on tests designed to assess executive functi n

Hypothesis 3

(Controlling for the effects of speed, intelligence and anxiety,) **There is a relationship** between neuropsychological impairment and symptom severity.

Prediction 3

(Controlling for the effects of speed, intelligence and anxiety,) There will be **a significant** correlation between scores on measures of OCD symptom severity and neuropsychological test performance.

Method

Subjects

OCD group

47 subjects, 19 male, 28 female were included in the study. All subjects met DSM III-R (APA) criteria for the disorder. Subjects were recruited from the psychological treatment unit at the Maudsley Hospital, a self-help group for people with OCD and from advertisements requesting volunteers with OCD to participate in a research project. The mean age of the group was 36.38 years (sd=9.46; range=23 to 70). Scores on clinical indices can be seen in Table 8.2.

Normal group

47 subjects were contacted and asked to participate in the study. Subjects were matched to the probands on age (within one year) and sex. Subjects were not matched on intelligence owing to practical difficulties in recruitment of subjects. No subject had any history of psychological disorder, and none had studied psychology at a post-graduate level or beyond. Subjects were paid £5.00 for their participation. Data from three subjects were excluded from the analysis, as scores on the Beck Depression Inventory (Beck et al. 1967) exceeded 15, indicating that they had moderate to severe depression. Another subject failed to return the questionnaires assessing depression, anxiety and obsessions. Since it was not possible to determine whether this subject had these features to a clinical degree, the data from this subject's neuropsychological assessments were not included in the analyses. Therefore data from 43 subjects were included in the analysis. Nineteen subjects were male, 24 female. Their mean age was 36.28 (sd=9.73; range 22-70). Scores on clinical indices can be seen in Table

8.2.

Measures

Clinical Measures

The Beck Anxiety Inventory (BAI: Beck, Epstein, Brown and Steer, 1988)

This is a 21-item scale comprising symptoms of anxiety. The scale measures the severity of anxiety in adults and children and symptoms are rated on a 4-point scale ranging from 0 ('not at all') to 3 ('severely: you could barely stand it).

The Beck Depression Inventory (BDI: Beck et al. 1961)

This is a 21-item scale comprising symptoms of anxiety. The scale measures the severity of depression in adults and children symptoms are rated on a 3-point scale ranging from 1 to 3.

Maudsley Obsessional Compulsive Inventory: (MOCI; Hodgson and Rachman, 1977)

This is a 30-item questionnaire. Subjects are requested to respond `TRUE' or `FALSE' to each item. There are four subscales: checking, washing, doubting and slowness.

Neuropsychological Measures

Money's Road Map of Directional Sense (Money et al. 1965)

This spatial test reflects an ability to mentally rotate in space, and performance may be impaired by both basal ganglia and frontal lesions. Subjects are presented with a simulated street map comprising two routes. The first route has four turns and is used for practice. The second route has 32 choice points, and is divided into two sections of 16 turns each. Subjects are told to imagine going along the route as if they were walking and to indicate whether they would be turning right or left at each choice point. In the first half, the direction of travel is congruent with the subject's body orientation. In the second half, the direction is

reversed and therefore travel proceeds in a direction rotated 180 degrees from the subject's body orientation. The map remains in a fixed position in front of the subject, who is instructed that twisting or turning the body to facilitate left-right judgements is not allowed. The sequence of turns along the routes is random, with an equal number of left and right turns. The number of correct responses is recorded. This test is not timed.

The Block Design Test (Wechsler et al. 1981)

This is a sub-test of the WAIS-R (Wechsler et al. 1981). The test is designed to assess visuo-spatial skills and is thought to reflect the functioning of the basal ganglia/right hemisphere. Nine blocks (cubes) are presented coloured red on two sides, white on two sides and half red, half white on two sides. 9 cards with printed designs are bound into a booklet. The subject works directly from a block model constructed by the examiner for the first design, and from printed cards for designs 2-9. The edge of the model and designs are always oriented so that the unbound edge of the card or model is toward the subject. In laying out the blocks for the subject to use, care is taken that a variety of surfaces face up, that only one out of the four blocks has the red/white side facing up, and only three blocks have the red/white side facing up when 9 blocks are in use. There is a time limit for each design. For the first two designs, a second trial is allowed and timing begins again. The exact time taken to complete each design is recorded if it is within the time limit. An item is failed if the subject's design is faulty (i.e. does not match the model precisely) or is not completed in the allotted time. Rotation of a design by about 30 degrees or more is considered a failure. This test is timed.

The Modified Wisconsin Card Sorting Test (WCST) (Nelson et al., 1976; Heaton et al., 1981)

This test is designed to assess set-shifting ability and is considered to reflect frontal lobe functioning. Four stimulus cards are placed in front of the subject - one red triangle, two green stars, three yellow crosses, and four blue circles. The subject is then handed a deck of 64 response cards and instructed to match each one of the response cards to one of the four stimulus cards. They are told that the examiner cannot tell him/her how to match the card, but will inform him/her whether the response is correct or not. The subject has to deduce the correct sorting principle without help. The same sorting principle remains in effect for 6 consecutive correct sorts, after which the principle changes without warning. The test is discontinued after all 64 cards have been sorted. The number of completed categories, correct responses, perseverative responses, perseverative errors, nonperseverative errors, and unique errors are scored as outlined by Heaton (1981). This test is not timed.

The Brixton (Burgess and Shallice, 1994a)

This is a new test designed to assess set-shifting ability and is considered to reflect frontal lobe functioning. It allows an assessment of the ability to detect rules using a test that is not confounded by salient aspects of the stimulus situation, colour, shape and number like the WCST. In this rule attainment test, the rules are related to the relation between successive cards and do not correspond to any perceptually salient aspect of the stimuli. The test comprises 56 A4 pages with 10 circles in two rows of 5. Nine of the circles are empty and one is filled in. Pages differ only in the position of the filled circle, which has a relation to its position on the preceding page that obeys one of a number of rules. The number of the consecutive pages where a particular rule applies varies in an unsystematic fashion from 3 to

8, so that changes in the rule cannot be anticipated. Subjects are instructed to work out where the coloured circle is going to be on the next page. The number of errors in guessing where the coloured circlee is going to be is recorded. A guess is not considered to be an error at the point where the rule has changed and the subject is still following the previous rule. This test is not timed.

Controlled Tests of Word Association (FAS) (Benton and Hamsher, 1976)

This test is designed to assess verbal fluency and is considered to reflect executive functioning of the frontal lobe. Subjects are given one minute to think of as many words as they can which begin with the letter `F'. The number of words reported and the number of words that are repeated are recorded. The procedure is repeated with the letters `A' and `S'. This test is timed.

Hayling (Burgess and Shallice, 1994b)

This is a new test and is considered to reflect the executive functioning of the frontal lobe. In this task, the differing components of initiation and inhibition can be examined with minimal changes in the background characteristics of the task (unlike tests such as the Stroop). 20 sentences in which the last word is omitted are presented to the subject, the sentences being chosen such that there is a high probability of a particular response occurring. The subject's task is to complete the sentence. In the first half (10 sentences) the subject can complete the sentence with any word; in the second half (10 sentences) subjects are instructed to complete the sentence with a word which makes no sense in the context; in this second condition the rational response has to be inhibited. This test is timed.

Speed Task

This is a straightforward task in which subjects are given an A4 sized piece of paper with letters A to E printed randomly in 11 rows and 8 columns (see appendix 2). Subjects are first required to count up the number of A's on the page as quickly as they can and inform the examiner. After this has been completed, subjects are asked to cross off (place a line) through all the B's on the page and tell the examiner when the task has been completed. The mean speed for these two tasks is calculated and used in the analyses. This test is timed.

National Adult Reading Test (NART; Nelson and O'Connell, 1975)

The NART comprises a list of 50 words printed in order of increasing difficulty. The words are relatively short and are all `irregular' with respect to the common rules of pronunciation. The subject reads aloud down the list of words and the number of errors made is recorded. Full scale WAIS (Wecshler et al. 1951) IQ can be predicted from this reading error score by inserting it into the appropriate formula. This test is not timed.

8.3.4. Results

The alpha level was set at 0.05. The mean scores of the two groups on the clinical indices are given in Table 8.2.

Table 8.2 . Mean Scores on Clinical Indices.

	Obsessionals (n=47)	**Normals (n=44)**
MOCI total	17.15 (4.83)	3.34 (2.41)
MOCI checking	6.21 (1.79)	0.71 (0.97)
MOCI washing	3.76 (2.51)	1 (1.4)
MOCI doubting	5.2 (1.29)	1.41 (1.16)
MOCI slowness	2.45 (1.77)	2.24 (0.66)
BDI	17.53 (9.04)	3.71 (3.11)
BAI	19.13 (9.7)	4.29 (3.8)

Both groups had above average intelligence as measured by the NART. The mean full IQ scores for the obsessional and normal group were 111.23 (sd=6.33) and 114.16 (sd=6.03) respectively ($t=-2.17$, $p<0.05$). The obsessional group were significantly slower on the Speed Test than the normal controls (mean for obsessional group=17.25, sd=3.82; mean for normal group=14.46, sd=3.2; $t=3.7$, $p<0.05$)

Prediction 1

Simple Factorial Analyses of Variance (ANOVA) were conducted to determine whether there were any significance differences between the groups on measures of visuo-spatial abilities i.e. block design and the Money Road Map Test. There was a trend for the obsessional subjects to have a worse performance on the block design than normals. This trend approached significance as can be seen in Table 8.3. There was also a non-significant trend for the obsessionals to perform more poorly on the Money Road Map task (see Table 8.3). When

scores on the Speed Test and NART IQ were entered as covariates, the trend for the obsessional group to score worse on the Block Design disappeared $F(1,73)=0.31$, $p=0.579$.

Table 8.3 Visuo-Spatial Test Performance (not controlling for other variables)

	Obsessionals	Normals	F	p
Block Design	32.26 (9.27)	36.26 (9.99)	3.62 (1,80)	0.061
Money Road Map Test - Number of Errors	3.8 (5.14)	2.65 (3.4)	1.43 (1, 80)	0.235

Prediction 1 was not fulfilled.

Prediction 2

Multiple Analyses of Variance (MANOVA) were conducted to determine whether there were any significant differences between the groups on measures of frontal abilities. Hotellings $T^2 = 2.84$ (6,79), $p<0.05$, indicating that there was a significant overall difference between the groups when the measures of frontal abilities were entered as dependent variables. It was then appropriate to do further analyses using univariate tests to detect the specific measures that may differ between groups. The results are summarised in Table 8.4. There was a non-significant trend for obsessionals to complete fewer categories and show more perseverative errors than the normal control group on the WCST. There was also a non-significant trend for obsessionals to show more errors on the other task of set-shifting, the Brixton. Obsessionals produced significantly fewer words on the COWA test, and there was a significantly greater difference between the time taken to respond to the straightforward sentence completion on the Hayling and the nonsense completion section. There were no

significant differences on the number of errors made on this test.

Table 8.4. Scores on tests of Executive Function (not controlling for other variables).

	Obsessionals	Normals	F	p
WCST categories completed	4.15 (2.11)	5.05 (2.16)	3.49 (6,79)	0.065
WCST perseverative errors	14.91 (5.88)	12.67 (5.66)	3.02	0.085
Brixton errors	13.72 (5.16)	13.72 (5.16)	3.59	0.062
Hayling difference (A-B)	25.12 (21.52)	14.66 (17.35)	6.66	0.012
Hayling errors	2.98 (3.81)	3.35 (3.52)	0.08	0.773
Verbal Fluency	14.61 (3.85)	17.19 (4.26)	8.89	0.004

The analyses were repeated entering scores on the Speed Test and NART IQ as covariates. Hotellings T^2 was no longer significant $F(6,72)=0.36$ showing that there was no overall difference between the groups on these indices. It was therefore inappropriate to continue to conduct univariate analyses of variance.

This prediction was therefore not fulfilled.

Prediction 3

Both Groups Joined

Correlational analyses were conducted using Spearman's Rank Correlation Coefficient to determine whether there were any significant associations between scores on clinical indices

and scores on neuropsychological assessments. Given the large number of correlations that were conducted, the alpha level was set at 0.01. The correlation matrix is shown in Table 8.5. There was a significant negative correlation ($r=-0.29$, $p<0.01$) between total scores on the MOCI and number of errors on the Brixton. Since there was also a significant positive association between scores on the BAI and number of errors on the Brixton ($r=0.36$, $p<0.01$), the correlations were re-run, partialling out the effects of anxiety. The significant association between total scores on the MOCI and number of errors on the Brixton disappeared ($r=-0.01$, n.s.).

Table 8.5. Correlations among Neuropsychological and Obsessional Variables (both groups joined (n=91)

	WCST		Verbal Fluency	Brixton Errors	Hayling		Money Errors	Block Design
	Categories	Perse-verative Errors			Errors on Section B	Differ-ence (B-A)		
MOCI total	-.1879	.1442	-.2895**	.2265*	-.0372	.2047	.1522	-.2102
-checking	-.2037	.1814	-.2455	.2054	-.0333	.2878 **	.1432	-.2555
-washing	-.0449	.0578	-.2010	.1521	-.0148	.1004	.0356	-.1349
-slow	.0664	-.0691	-.0853	-.0676	-.0516	-.0462	.1389	.1108
-doubt	-.1731	.0868	-.2408	.2004	-.1171	.1819	.0714	-.0234
BAI	-.2099	.1304	-.1288	.3591**	-.1102	.1254	.1251	-.0922
BDI	-.1025	.1575	-.1833	.2020	-.1558	.0719	.1613	-.0887

There was also a significant association between the difference in time taken to complete sections A and B in the Hayling Task and the checking subscale of the MOCI ($r=0.29$, $p<0.01$). The differences remained significant when the effects of anxiety were partialled out ($r=0.28$, $p<0.01$).

The analyses were repeated, partialling out the effects of performance on the Speed Task and NART IQ. No significant associations remained, except for a positive correlation between anxiety and number of errors on the Brixton ($r=0.32$, $p<0.01$).

Correlational Analyses for the Obsessional Group Only

Correlational analyses were conducted partialling out the effects of performance on the Speed task and NART IQ. The only significant correlation was between errors on the Brixton and anxiety ($r=0.54$, $p<0.01$). There was a strong but non-significant correlation between depression scores and number of perseveration errors on the WCST ($r=0.43$, $p=0.02$).

Correlational Analyses for the Normal Control Group Only

Correlational analyses were conducted partialling out the effects of performance on the Speed task and NART IQ. The only significant correlation was between verbal fluency scores and the total score on the MOCI ($r=-0.414$, $p<0.01$). There was a non-significant association between (i) depression scores and (ii) checking total on the MOCI, and errors on the Money Road Map Test ($r=0.35$, and $r=0.38$ respectively, $p<0.05$). The strong association between verbal fluency scores and total score on the MOCI was removed by partialling out the effects of depression ($r=-0.19$, n.s).

Summary of Results

Prediction 1 - This prediction was not fulfilled. Taking account of performance on the speed task and IQ scores, there were no significant differences between groups on measures of visuo-spatial abilities.

Prediction 2 - This prediction was not fulfilled. Taking account of performance on the speed task and IQ scores, there were no significant differences between groups on measures of

abilities served by frontal lobe.

Prediction 3 - This prediction was partially fulfilled. There was no association between the majority of neuropsychological and clinical variables, when the effects of depression, speed and NART IQ were partialled out. However, in the obsessional group, there was an association between anxiety and the number of errors made on the Brixton.

8.3.5. Discussion

The results did not show patients with OCD to have deficits in either frontal lobe abilities or visuo-spatial abilities, once the effects of depression, anxiety, intelligence scores and speed were taken into account. The finding that obsessionals had a deficit in verbal fluency relative to controls could probably be explained in terms of depression. This study replicates that of Martinot et al. (1990) but differs from many of the other studies (see Table 8.1). However, the other studies failed to control for speed, anxiety and depression.

There were no significant associations between scores on the MOCI (the clinical index of obsessions) and neuropsychological test performance. However, there was an association between anxiety and number of errors on the rule detection task (Brixton) in the obsessional group but not in the normal controls. It may be that, when the rule is unknown, people prone to anxiety become particularly anxious and unable to concentrate on detection. People less prone to anxiety (the normal controls) may not respond to rule detection with the same increase in anxiety. However, it is difficult to see why this may be the case for the `Brixton' as opposed to the WCST where detection of sets is also important.

The utility of neuropsychological assessments has been questioned in section 8.2.1. Heeding the warnings of Otto et al. (1990), it is not possible to interpret these results in terms

of the presence/absence of a deficit in the frontal lobe or basal ganglia. However, it is possible to make some general comments in terms of the cognitive strengths and weaknesses associated with OCD.

Generally, the analyses showed the importance of considering speed, intelligence, anxiety and depression when determining differences between groups. Ideally, groups would be matched on these variables before neuropsychological testing commenced, but it becomes extremely difficult in practical terms to match subjects on 4 variables (age, sex, speed and intelligence). The best control group would comprise anxious or depressed subjects obtained randomly, matched on all four criteria, but recruitment of such a group is likely to be impossible without immense resources in human and financial terms. Statistical controls are more practical and the influence of speed and intelligence can be accounted for. This study shows how necessary it is to take account of such influences before making interpretations of the data.

The study helps elucidate the cognitive strengths and weaknesses associated with OCD in general. Although the obsessional group had a relatively lower NART IQ than the controls, both groups were considerably above average (IQ=100), and it cannot be concluded that the obsessional group had an 'intelligence deficit' or any other 'deficit' except for speed. Speed deficits appear to characterise OCD and therefore influence performance on neuropsychological tests. It is possible that such a deficit is a primary problem - for example Rachman (1978) has described a group with primary obsessional slowness. However, it has been difficult to distinguish such a sub-group from those with secondary obsessional slowness (Darnley, 1995, personal communication) as people who check (or wash or hoard) are delayed on other tasks owing to their obsessional problem (see Veale, 1993).

The utility of neuropsychological tests in informing about strengths and weaknesses associated with OCD is dependent on establishing a relationship between OCD symptoms and neuropsychological test performance. Furthermore, the pattern of neuropsychological deficits **must be specific** to OCD in order to inform us meaningfully about the characteristics of this disorder, as opposed to others. It is incorrect to use such tests as 'lesion detectors'. However, this study and others have failed to find a relationship between OCD symptoms and neuropsychological test performance and the utility of these assessments is questionable.

8.4. Summary

Deficits have been shown in the performance of OCD patients on neuropsychological tests assumed to reflect performance of the basal ganglia/right hemisphere and the frontal lobe. However, such deficits have not been found consistently, perhaps because factors such as speed, intelligence and anxiety have not been fully considered. No relationship has been found between OCD symptom severity and neuropsychological test performance. A study was conducted to determine neuropsychological test deficits in patients with OCD and normal controls. Once speed, intelligence, anxiety and depression were taken into account, there were no differences between groups on any of the neuropsychological test variables. There were no associations between neuropsychological test performance and the measure of obsessionality, once speed, intelligence, anxiety and depression were considered, with the exception of a relationship between errors on the rule detection task and anxiety levels in the obsessional group.

Given that neuropsychological tests cannot act as 'lesion detectors', the utility of neuropsychological assessments in OCD is debatable.

References for Table 8.2.

[01] Wechsler, D. (1955). Wechsler Adult Intelligence Scale: Manual. New York: Psychological Corporation.

[02] Halstead, W.C. (1947). Brain and intelligence. Chicago. University of Chicago Press.

[03] Reitan, R.M., and Davison, L.A. (1974). Clinical neuropsychology: current status and applications. New York. Hemisphere.

[04] Money, J. (1976). A Standardized Road Map Test of Direction Sense: Manual. San Rafael, California: Academic Therapy Press. Chicago.

[05] Milner, B. (1965). Visually-guided maze learning in man: effects of bilateral hippocampal, bilateral frontal, and unilateral cerebral lesions. Neuropsychologia, 3, 317-33.

[06] Osterreith, P.A. (1944). Le test de copie d'une figure complexe. Archives de Psychologie, 30, 206-356.

[07] Heaton, R.K. (1981). Wisconsin Card Sorting Test Manual. Odessa, FL: Psychological Assessment Resources.

[08] Nelson, H.E. (1976). A modified card sorting test sensitive to frontal lobe defects. Cortex, 12, 313-324.

[09] Luria, A.R. (1965). Two kinds of motor perseveration in massive injuries of the frontal lobes. Brain, 88, 1-10.

[10] Benton, A.L., and Hamsher, K. de S. (1976) Multilingual aphasia examination. University of Iowa, Iowa City, Iowa.

[11] Wechsler, D. & Stone, C. (1945). Manual for the Wechsler Memory Scale. The Psychological Corp: New York.

[12] Benton, A.L., Varney, N.R., and Hamsher, K. (1978). Visuo-Spatial judgement. A clinical test. Archives of Neurology, 35, 364-367.

[13] Purdue Research Foundation (1948). Examiner's manual for the Purdue Pegboard. Chicago: Science Research Associates.

[14] Arthur, G. (1947). A Point Scale of Performance Tests. Revised Form II. New York. Psychological Corporation. Chicago. Stoelting.

[15] Kagan, J., Rosman, B.L., Day, D., Albert, J., and Phillips, W. (1964). Information processing in the child: Significance of analytic and reflective attitudes. Psychological Monographs, 78 (1).

[16] Benton, A.L. (1974). The Revised Visual Retention Test (4th edition). New York: Psychological Corporation

[17] Army Individual Test Battery (1944). Manual of directions and scoring. Washington, D.C: War Department, Adjunct General's Office.

[18] Stroop, J.R. (1935). Studies of interference in serial verbal reactions. Journal of Experimental Psychology, 18, 643-662.

[19] Wechsler, D. (1981). WAIS-R manual. New York: Psychological Corporation.

[20] Thurstone, L.L. (1938). Primary Mental Abilities. Chicago. University of Chicago Press.

[21]Semmes, J., Weinstein, S., Gent, L., and Teuber, H.L. (1963). Correlates of impaired orientation in personal and extrapersonal space. Brain, 86, 747-771.

[22]Raven, J. (1960). Guide to the standard progressive matrices, sets A,B,C,D and E. Lewis, London.

[23] Stuss, D.T., Kaplan, E.F., Benson, D.F., Weir, W.S., Chiulli, L., and Sarazin, F.F. (1982). Evidence for the involvement of orbitofrontal cortex in memory functions: an interference effect. Journal of Comprehensive Physiology and Psychylogy, 96, 913-925.

[24] Jones-Gotman, M., and Milner, B. (1977). Design Fluency: the invention of nonsense drawings after focal cortical lesions. Neuropsychologia, 15, 653-674.

[25]Hooper, H.E. (1958). The Hooper Visual Organization Test Manual. Western Psychological Services: Los Angeles.

[26]Rey, A. (1964). L'examen clinique en psychologie. Presses Universitaires de France, Paris.

[27]Delis, D. Kramer, J. Ober B. & Kaplan, E. (1986). The California Verbal Learning Test. The Psychological Corporation, San Antonio, TX.

[28]Corsi, P. (1972) Human memory and the medial temporal region of the brain. [Ph.D. thesis, McGill University].

[29]Kimura, D. (1963). Right temporal lobe damage. Archives of Neurology, 8, 264-271.

[30] Newton, N.A., and Brown, C.G. (1985). Construction of matched verbal and design continuous paired associates tests, Journal of Clinical and Experimental Neuropsychology, 7, 97-110.

[31] Porteus, S.D. (1965). Porteus Maze Test. Fifty years' application. New York: Psychological Corporation.

[32] Martin, A., Pigott, T.A., Lalonde, F.M., Dalton, I., Dubbert, B., and Murphy, D.L. (1993). Lack of Evidence for Huntington's Disease-like Cognitive Dysfunction in Obsessive-Compulsive Disorder. Biological Psychiatry, 33, 345-353.

[33] Triesman, A., and Souther, J. (1985). Search Asymmetry: A diagnostic for preattentive processing of separable features. Journal of Experimental Psychology [Gen], 114, 285-310.

[34] Veale, D.M. Sahakian, B.J. Owen, A.M. & Marks, I.M. (Submitted). Cognitive deficits in tests sensitive to frontal lobe dysfunction in obsessive compulsive disorder.

CHAPTER 9

The Heterogeneity of OCD

'Inevitably, the beginning clinician is struck by the diversity of the clinical presentations of OCD. However, this initial impression is soon replaced by the realization that the number of types of obsessions are remarkably limited and stereotypic....One of the major advantages for researchers working with OCD is its relative homogeneity' (Rasmussen and Eisen, 1994 Chapter 2, p.19, 13).

'OCD is biologically homogeneous' (Okasha et al. 1994)

'Obsessive-compulsive disorder is a heterogeneous condition' (Pauls et al., 1995, p. 76)

'The identification of homogeneous subgroups of OCD patients has remained elusive'

(Baer, 1994, p.18)

9.1. Introduction

Throughout this thesis, reference has been made to the 'heterogeneity hypothesis' and data have been generated in order that the hypothesis may be tested. This chapter details the different meanings of 'heterogeneity' and the context in which it is considered in the current analysis. The literature is reviewed with respect to heterogeneity, and its importance is made explicit. Cautions against using the term too broadly are made. The heterogeneity hypothesis is explained, and prerequisites for the testing of the hypothesis are detailed. The next sections test whether such prerequisites were met in the current study. The following tests are made

to determine whether:

1 **Performance on neuropsychological tests is intercorrelated.**

2 **Performance on neuropsychological tests is correlated with neurological soft signs**

3 **Anxiety, guilt and responsibility are inter-correlated**

On the basis of findings from these tests, the heterogeneity hypothesis is revised, and two alternative heterogeneity hypotheses are posited. These revised hypotheses are both tested. The chapter concludes by discussing the findings and the `heterogeneity of heterogeneity'.

9.2. What is meant by `Heterogeneity'

Throughout this thesis, reference has been made to the `heterogeneity' of OCD. Heterogeneous can be defined as 'composed of diverse elements' (Oxford Dictionary), whereas homogeneous means 'of the same kind or nature; uniform'. There may be different sorts of heterogeneity. For example, cars are heterogeneous both in terms of colour, and in terms of manufacturers. Depression is considered to be heterogeneous in terms of aetiology (social, chemical, cognitive and behavioural factors are all implicated), treatment (medication vs psychological therapies) and, perhaps, in clinical presentation (bipolar affective disorder vs major depressive episode). Within a heterogeneous group, there may be homogeneous subgroups.

9.3. Literature Review on Heterogeneity

Within OCD, there may be different sorts of heterogeneity, with various homogeneous subgroups. For example, McDougle et al. (1990) reported on a subgroup of 9 of 17 patients with treatment-resistant OCD who responded to the addition of a neuroleptic. A positive response to treatment was associated with comorbid tic disorder in this subgroup and it was suggested that such patients have impairment in both CNS dopamine **and** serotonin system. Different personality subtypes have been hypothesised to form homogeneous subgroups within OCD. Patients with comorbid Cluster A personality disorders (e.g. schizotypal and paranoid personality disorders) have been found to be significantly less responsive to both pharmacological and psychological treatment (Baer et al. 1992; Minichiello et al., 1987). Quantitative electroencephalography (QEEG) has been used to try to identify homogeneous subgroups of OCD patients. Marked differences between baseline QEEG patterns were found between responders and non-responders to medication, and cluster analysis revealed a relationship between cluster membership and treatment outcome (Prichep et al, 1991; Mas et al, 1991).

The findings of Pauls et al. (1986, 1992) of a genetic relationship between OCD and Tourette's Syndrome (TS) have led to the suggestion that people with OCD who have TS in the family form a distinct subgroup (George et al. 1993; Holzer et al. 1994). The current movement towards establishing a variety of `obsessive compulsive related disorders' (Hollander, 1994) carries with it the assumption that OCD is a heterogeneous disorder. One of the fundamental questions in OCD research at present concerns the boundaries of the disorder and whether it is one disorder or several different ones (Insel, 1994). Body Dysmorphic Disorder, Anorexia Nervosa, Hypochondriasis, sexual compulsions, pathological gambling and impulsive personality disorder are all considered to lie along a hypothesised

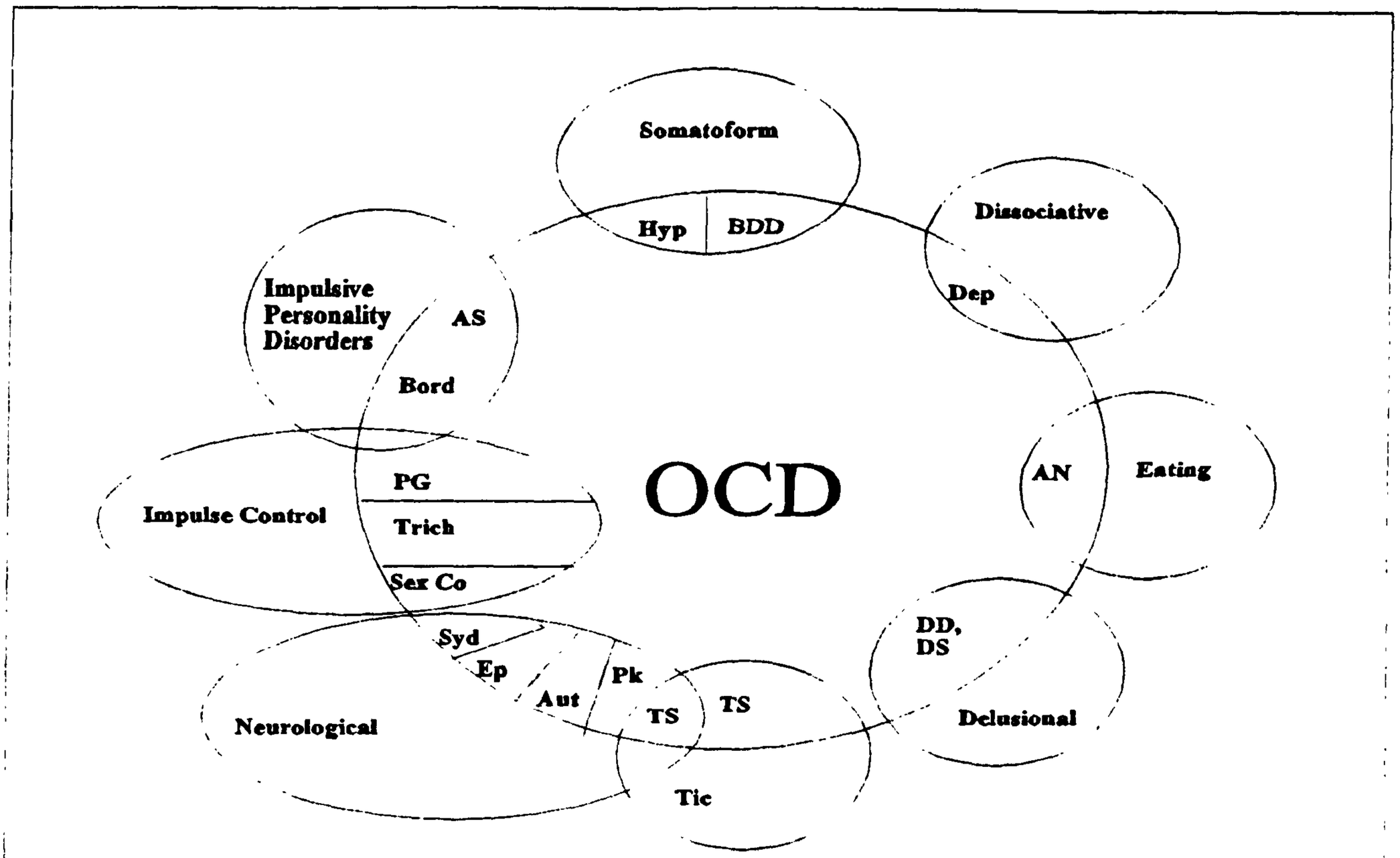


Figure 9.1. The Spectrum of Obsessive Compulsive Related Disorders (From Hollander, E. 1993, p.2). Overlap between OCD and somatoform, dissociative, eating, delusional, tic, neurological, impulse control, and impulsive personality disorders (Note the absence of overlap between OCD and anxiety / depressive disorders). Abbreviations (clockwise from top): Hypochondriasis (Hyp); body dysmorphic disorder (BDD); depersonalization (Dep); anorexia nervosa (AN); delusional disorder, somatic subtype (DD, SS); Tourette's Syndrome (TS); Parkinson's disease (Pk); Autism (Aut); epilepsy (Ep); Sydenham's Chorea (Syd); sexual compulsions (Sex Co); trichotillomania (Trich); pathological gambling (PG); borderline personality disorder (Bord); antisocial personality disorder (AS).

'spectrum' of OCD (Stein and Hollander, 1993). The conceptual relationship between such subgroups is shown in Figure 9.1.

Several spectrums are suggested to exist based on apparent overlaps in pathogenic mechanisms and phenomenological overlap between the disorders, although no relationship uniting the different spectra is discussed (Stein and Hollander, 1993). The authors consider their analysis to have implications for the classification of OCD and, in fact, suggest that it be redefined.

> 'Our review indicates that the current classification of OCD perhaps overemphasizes the link between OCD and anxiety, and downplays the relationships between OCD and its related disorders...Hopefully the current DSM-IV field trials will help in the revision of the diagnostic criteria for OCD' (Stein and Hollander, p. 262).

In DSM IV (APA, 1994), OCD is still characterised as an anxiety disorder, although it is stated that 'There is a high incidence of Obsessive-Compulsive Disorder in individuals with Tourette's Disorder' (p.419). There is not a similarly high incidence of Tourette's disorder in OCD (Pauls et al. 1992).

Perhaps the reason that the search for homogeneous subgroups has remained elusive (Baer, 1994) is because none exist. Rasmussen and Eisen (1991) imply that it is only naive psychologists who search for homogeneous subtypes since 'the inexperienced clinician is immediately struck with the diversity of clinical presentations of OCD' (p.36). According to Rasmussen and Eisen, different phenomenological sub-groups (such as cleaners and checkers) are similar in terms of demographic variables, course of illness, other clinical features and comorbid diagnosis. Other evidence used to argue for the relative homogeneity of the disorder in terms of symptom subtypes includes: (a) patients frequently present with multiple obsessions and compulsions; (b) patients usually have several principal obsessions or compulsions over the course of their illness; and (c) in families that have more than one

member affected by OCD, the clinical subtype is frequently different. Heterogeneity on the basis of symptom subtypes is dismissed by Rasmussen and Eisen (1991), who instead suggest a different type of heterogeneity, based on what they term the 'core features' of the disorder. These 'core features' are:-

- Abnormal risk assessment
- Pathological doubt
- Need for Certainty or Completeness

Rasmussen and Eisen's conceptualisation of the heterogeneity of OCD can be seen in Figure 9.2.

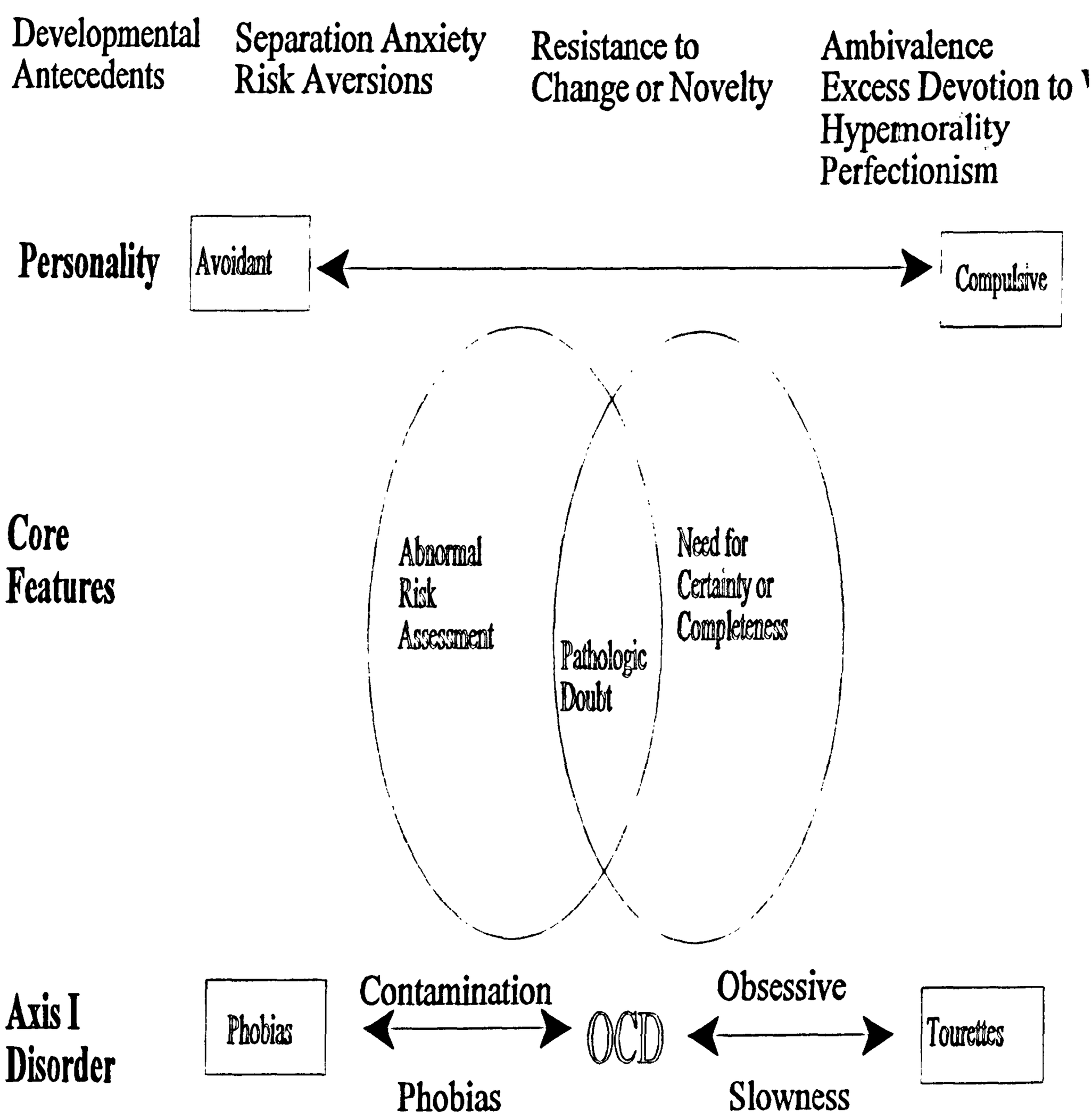


Figure 9.2. Heterogeneity and comorbidity in OCD: Relationship to core features and developmental antecedents (Rasmussen and Eisen, 1991; p. 35).

Other sub-groups have been suggested. Baer (1994) conducted a factor analysis of

symptom subtypes of OCD according to the responses of 107 patients with OCD on the Yale Brown Obsessive Compulsive Scale (YBOCS; Goodman et al. 1989).

9.4. Why Heterogeneity is Important

Identification of subgroups within OCD is important for a variety of reasons. Primarily, it may be that different sorts of treatments will work better for different subgroups. Chapter 5 showed that exaggerated perceived responsibility characterised people with checking compulsions more than those with cleaning compulsions. Therefore, any cognitive therapy based on targeting cognitions concerning unrealistic appraisals of responsibility is predicted to be more effective for checkers than cleaners. Similarly, there is some evidence that checkers are slower to respond to treatment than cleaners (Foa and Goldstein, 1978).

However, it is important not to <u>create</u> subgroups, merely on the basis of differential response to treatment without a clear theoretical foundation. Response to treatment may be one method of obtaining validity for suggestions of subgroups, but it is circular to argue that subgroups exist because they predict differential response to treatment, when differential treatment response has been used to <u>formulate</u> the original subgroups. Other reasons why it is important to identify homogeneous subgroups include:-

- Refinement in the understanding of the aetiology of the disorder (including genetics)
- Improvement of predictions about the course of the disorder,
- An increased awareness of the connections between both subgroups and major groups such as OCD and tic disorders.

Even if groups are similar in terms of phenomenology, if there is no utility in considering one disorder as a subgroup of another in terms of improving treatment, understanding or

prognosis, it is suggested that such a re-classification could be at worst, confusing and, at best, pointless.

9.5. Cautions: Heterogeneity and Redefinition

Salkovskis (1995) has cautioned against the current trend to redefine OCD on the basis of hypothesised homogeneous subgroups. He argues that OCD and other problems can appear similar on a superficial level, and repetitive behaviours such as tics are suggested to fall within this category. Alternatively, psychological processes may be shared between disorders; for example, both OCD and hypochondriasis may be characterised by the belief that some feared catastrophe will occur at some future time. Although common processes may occur in different combinations across the range of disorders, there is no reason, according to Salkovskis, to abandon the concept of OCD as a distinct disorder characterised by a clearly identifiable pattern of thinking and behaviour.

9.6. The Heterogeneity Hypothesis

'A fundamental divide in the literature appears to be between those who consider OCD to be a neurological problem, and those who consider it to be a psychological problem' (Tallis, 1995).

The current hypothesis of heterogeneity refers to heterogeneity in terms of neurological/neuropsychiatric impairment and in terms of cognitive-behavioural impairment.

Specifically, the hypothesis being tested is:-

There will be two separate, homogeneous subgroups within the sample of OCD patients. One of these groups will be characterised by neurological /neuropsychological impairments, the other will be characterised by high levels of anxiety, guilt and responsibility.

This is shown diagrammatically in Figure 9.3.

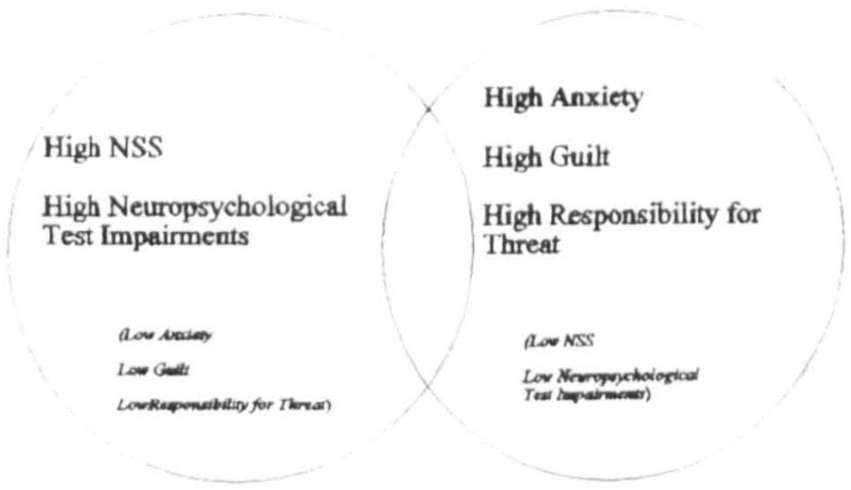


Figure 9.3. Diagram of the Heterogeneity Hypothesis

The suggestion that there will be a group with neurological/ neuropsychological impairments stems from the `basal ganglia' dysfunction model of OCD (see chapter 7 for a review of the model). A group with high levels of anxiety, guilt and responsibility stems from the cognitive-behavioural model of OCD (see chapter 2 for a review of the model).

Whilst other types of heterogeneity may exist within the obsessional population (e.g. checkers and cleaners), the current heterogeneity hypothesis was made for a variety of reasons. Firstly, and perhaps most strikingly, the literature on the 'basal ganglia' hypothesis of OCD (eg Rapoport and Wise, 1989) makes no reference to the cognitive-behavioural model of OCD and little mention of the fact that OCD is classified as an anxiety disorder. It was noted that 'clinically, a great deal of information appears to be inconsistent with our

'basal ganglia hypothesis' of OCD' (Wise and Rapoport, 1989, p. 340). The 'basal ganglia' model of OCD is a deficit model (Salkovskis, 1995) in which the normal functioning of a system has been disrupted. However, this fails to take into account the work on `abnormal and normal' obsessions which has shown that unwanted, intrusive thoughts occur in the majority of the population (Rachman and de Silva, 1978; Salkovskis and Harrison, 1984), and work by Sher et al., (1983) showing that the normal population experiences `compulsions'. The pioneering work of Rachman and Hodgson (1980), and their wealth of clinical and empirical data on the nature of OCD, are ignored by the basal ganglia model. Notably, the model fails to account for the efficacy of behavioural therapy for OCD, its time course and behavioural specificity (Wise and Rapoport, 1989).

However, the cognitive-behaviourists, until recently, have not addressed the issue of the data in support of the basal ganglia deficit model (Salkovskis, Rachman and Shafran, 1995). Data from neuroimaging, neuropsychological deficits, and comorbidity with other 'neurological' disorders such as Tourette's Disorder have all been ignored by the cognitive-behavioural model. Salkovskis (1995) has suggested that such deficits may be secondary to the psychopathology of OCD or non-existent and, whilst acknowledging that all cognitions and behaviours have a biological substrate, a distinction is drawn between a biological substrate underlying behaviour and a deficit in a neurological system causing deviant behaviour.

It is possible that:-

- Both models are true and OCD is a heterogeneous disorder
- One model is true, and the other is false
- Both models are partial accounts of all patients
- Both models are false

(Bolton, 1995; personal communication).

At the start of the research for this thesis, there had been no attempt to integrate both of the approaches i.e. to test the first point, whether both models are true. In North America, there is an assumption among psychiatrists that the disorder is neurological. Given the evidence for both the basal ganglia deficit model and the cognitive-behavioural model of OCD, it was hypothesised that for some patients, their OCD would be characterised by neurological and neuropsychological dysfunction, whereas other people may have a disorder characterised by the features described by the cognitive-behavioural model, namely high levels of anxiety, guilt and responsibility.

9.7. Testing for Homogeneity within sub-groups

As the heterogeneity hypothesis stands, two separate groups of dysfunctions are suggested to exist. Within each group, however, dysfunctions are assumed to cluster together i.e. neurological and neuropsychological dysfunctions are assumed to form one cluster, and high levels of anxiety, guilt and responsibility are suggested to form another. Each cluster is assumed to form a homogeneous sub-group. The reason for the first cluster is that both neurological and neuropsychological deficits are considered to reflect basal ganglia dysfunction (or disruption in the frontal loop connected to the basal ganglia). The reason for the second cluster is that anxiety, guilt and responsibility are all considered to result from placing special significance on intrusive thoughts.

In order to test the heterogeneity hypothesis, it is first necessary to test that there are two groups which are themselves homogeneous. For the groups to be homogeneous, the following criteria must be met:-

GROUP 1

Subjects in this group must show neuropsychological test performance deficits and an abnormally high number of neurological soft signs. It is expected that neuropsychological test performance deficits and the number of neurological soft signs will be postively correlated.

GROUP 2

Subjects in this group must show higher levels of anxiety, responsibility and guilt than the normal population. It is therefore expected that these variables will be inter-correlated.

9.7.1. Testing whether performance on neuropsychological tests are inter-correlated

In the studies reviewed in chapter 8, no data were reported on the inter-correlations between different neuropsychological assessments. On occasion, it was noted that people with OCD had a deficit on one test and not another (Trail making Tests A and B, Aronowitz et al., 1995) and it is possible to deduce from this that it is unlikely that there will be a strong positive association between performances on these two measures. The lack of data reported may indicate that inter-correlations between measures are not significant.

The data generated in chapter 8 were used to test whether performance on neuropsychological tests were inter-correlated. Pearson's product moment correlation coefficient was calculated to determine the association between neuropsychological variables. The inter-correlation matrix is shown in Table 9.1. (n=47)

Table 9.1. Inter-Correlations between Neuropsychological Variables

	BLOCK	BRIXTON	HAYLING A TOTAL	HAYLING B TOTAL	HAYLING DIFFERENCE	HAYLING B-ERRORS
BLOCK	1.0000	.0280	-.0199	-.1508	-.1789	-.1836
BRIXTON	.0280	1.0000	-.1256	.1299	.2029	-.0952
HAYLING A TOTAL	-.0199	-.1256	1.0000	.5239**	-.0104	.1000
HAYLING B TOTAL	-.1508	.1299	.5239**	1.0000	.8359**	.3689*
HAYLING DIFFERENCE	-.1789	.2029	-.0104	.8359**	1.0000	.4029**
HAYLING B-ERRORS	-.1836	-.0952	.1000	.3689*	.4029**	1.0000
MONEY ERRORS	-.3430*	.4054*	-.1182	-.1269	-.0415	.0872
VERBAL FLUENCY	-.0951	-.0108	-.4295**	-.3612*	-.1588	-.2999*
WCST CATEGOREIS	-.0248	-.2875	.1382	.1326	.0719	-.1082
CORRECT	.1105	-.2983*	.0054	.0908	.1151	-.1279
PESEVERATIVB ERRORS	-.0990	.2905	.0304	.1445	.1623	.2431

Table 9.1. cntd.. Inter-Correlations between Neuropsychological Variables

	MONEY ERRORS	VERBAL FLUENCY AVERAGE	CATEGORIES	WCST CORRECT	PESEVERATIVE ERRORS	SPEED AVERAGE
BLOCK	-.3430*	-.0951	-.0248	.1105	-.0990	-.2447
BRIXTON	.4054*	-.0108	-.2875	-.2983*	.2905	.0269
HAYLING A	-.1182	-.4295**	.1382	.0054	.0304	-.0049
TOTAL						
HAYLING B	-.1269	-.3612*	.1326	.0908	.1445	.0583
TOTAL						
HAYLING	-.0415	-.1588	.0719	.1151	.1623	.0330
DIFFERENCE						
HAYLING	.0872	-.2999*	-.1082	-.1279	.2431	-.2257
B-ERRORS						
MONEY	1.0000	-.0850	-.1823	-.3532*	.3309*	-.2590
ERRORS						
VERBAL	-.0850	1.0000	.0932	.2586	-.2775	.0070
FLUENCY AVERAGE						
WCST						
CATEGORIES	-.1823	.0932	1.0000	.8670**	-.6143**	.0045
CORRECT	-.3532*	.2586	.8670**	1.0000	-.6971**	.0015
PERSEVERATIVE	.3309*	-.2775	-.6143**	-.6971**	1.0000-	.0873
ERRORS						

Given the multiple number of comparisons, tests were only considered to inter-correlate significantly if $p<0.01$ (**).

Aside from tests correlating within themselves (eg number of categories completed

on the WCST was highly associated with the number of perseverative errors in a negative direction), none of the psychological tests were highly inter-correlated. Although there was a trend for errors on the Money to be negatively correlated with performance on the block design, this did not reach significance, despite the tests being designed to assess the same abilities (Lezak, 1983).

9.7.2. Testing whether scores on neuropsychological tests are correlated with neurological soft signs

Hollander et al. (1990) examined the relationship between number of neurological soft signs and neuropsychological test performance. He found a significant association between neurological soft signs and a measure of visual memory retention (Benton's Visual Retention Test; Benton, 1974), but not between neurological soft signs and the Matching Familiar Figures Test, a test of visual recognition and matching (Kagan et al., 1964).

Associations between performance on neuropsychological measures and neurological soft signs were tested using data described in chapter 8. Pearson's product moment correlation coefficient was calculated to determine the association between neuropsychological variables and total number of neurological soft signs. The inter-correlation matrix is shown in Table 9.2. (n=24)

The significance level was set at $p<0.01$ owing to the large number of inter-correlations. Of note, the total number of Neurological Soft Signs was significantly associated only with performance on the speed task. Performance on the speed task was related to the number of sensory and reflex soft signs in particular. The number of errors on the Hayling part B was strongly associated with the number of hard neurological signs. There was a trend for the number of correct categories on the WCST to be positively associated with the number

of signs of suppression, with the number of perseverative responses being negatively associated with this type of neurological soft sign.

Table 9.2. Correlations between Neuropsychological Test Performance and NSS

	NEUROLOGICAL SOFT SIGNS					
	TOTAL	HARDSIGN	MOTOR	SENSORY	REFLEX	DYSKIN
BLOCK	-.2196	-.0802	-.2084	-.0303	-.0875	-.0495
BRIXTON	.0848	-.1071	.2422	-.0656	-.2967	-.0874
HAYLING	-.0855	.1794	.1139	-.3783	.0008	.0299
A TOTAL						
HAYLING	.1239	.3157	.1168	.0219	.0549	-.0243
B TOTAL						
HAYLING	.2058	.2645	.0532	.3016	.0553	-.0614
DIFFERENCE						
HAYLING	.2922	.7042**	.1719	.1240	.0340	.2079
ERRORS B						
MONEY	.1987	-.1356	.3100	-.1365	.0620	.3015
ERRORS						
SPEED	.4796*	.0447	.2447	.4854*	.5169*	-.1399
AVERAGE						
VERBAL	.0072	-.0963	.0008	.0718	-.2642	.0472
FLUENCY AVERAGE						
WCST						
CATEGORIES	.0836	.0152	-.0229	-.0597	.2121	-.0964
CORRECT	-.0027	-.1085	-.0421	-.0927	.0439	-.2127
PERSEVER.	-.0468	.0624	.0878	-.0748	-.1746	.2011
ERRORS						

Table 9.2 continued..

	PARKIN	SUPPRESS	CATATON
BLOCK	-.1977	-.1578	.2612
BRIXTON	.3856	-.2120	-.0317
HAYLING	-.2360	-.1342	-.0924
A TOTAL			
HAYLING	.0372	.0163	-.2124
B TOTAL			
HAYLING	.2292	.1059	-.2064
DIFFERENCE			
HAYLING	-.1740	.3660	-.1932
ERRORS B			
MONEY	.0489	-.0096	.0359
ERRORS			
SPEEDAV	.3277	.2084	-.1219
VERBAL FLUENCY			
AVERAGE	.1624	.0417	-.1006
WCST			
CATEGORIES	.0760	.4991*	-.1166
CORRECT	.0849	.3916	-.1338
PERSEVER.	.0140	-.4252*	.1093
ERRORS			

9.7.3. Testing whether anxiety, guilt and responsibility are inter-correlated

This was tested using data described in chapters 3-5. Data on the relationship between guilt and responsibility were reported in chapter 5 and a significant association was found between these variables in a large, obsessional population. Since this assumption was being

tested with a view to testing the overall heterogeneity hypothesis, subjects were only included in the analysis if neuropsychological data had also been collected. Although 47 subjects had had a neuropsychological assessment, the responsibility scale was a somewhat late addition to the questionnaire measures. Therefore, unfortunately, only 28 subjects received and completed a neuropsychological assessment, a responsibility scale, and assessments of guilt and anxiety. A Pearson's product-moment correlation coefficient was calculated to determine the association between anxiety, guilt and responsibility. The inter-correlation matrices are shown in Tables 9.3 and 9.4. Owing to the large number of correlations, significance levels were set at $p<0.01$.

Table 9.3. Inter-correlations between measures of anxiety and measures of guilt and responsibility.

	Beck Anxiety	Four Systems Anxiety Total	Anxiety Sensitivity Index
Responsibility total	.4326*	.5679**	.4513*
Guilt total	.2804	.5790**	.3630
Guilt standards	-.4480*	-.1303	.0599
Guilt trait	.3423	.5608**	.2748
Guilt State	.5110**	.5892**	.4123*

Table 9.4. Inter-correlation between measures of measures of guilt and responsibility.

	GUILT			
	Total	Standards	Trait	State
Responsibility Total	.4797*	-.2026	.5803**	.3896

** p<0.001

The correlational analysis showed that anxiety, as measured by the FSAQ, was associated significantly with responsibility and with total guilt, trait guilt and state guilt, but not guilt standards. There was a tendency for anxiety as measured by the BAI to be associated with the same measures of guilt, but owing to the small sample size, these correlations did not reach significance. Responsibility was significantly associated with trait guilt, but again, owing to the small sample size, strong correlations between state guilt and total guilt did not reach statistical significance.

9.7.4. Summary of tests of Homogeneity

The analyses indicated that homogeneous sub-groups did not exist in the general manner suggested by the heterogeneity hypothesis. There was no significant association between the majority of the neuropsychological test measures, nor between neuropsychological test performance and neurological soft signs. A strong relationship between anxiety, guilt and responsibility indicated that there may be a homogeneous group characterised by these variables.

9.8. Revisions to the Heterogeneity Hypothesis

Based on the tests for homogeneity, the heterogeneity hypothesis was revised to take account of the analysis showing that people with neurological soft signs and

neuropsychological impairments did not form a homogeneous subgroup.

Either:

(1) There will be two separate, identifiable subgroups within the sample of OCD patients. One of these groups will be characterised by neurological impairments (NSS), the other will be characterised by high levels of anxiety, guilt (and responsibility.)

Or:

(2) There will be two separate, identifiable subgroups within the sample of OCD patients. One of these groups will be characterised by errors on the Money Road Map Tests and poor performance on the block design, the other will be characterised by high levels of anxiety, guilt and responsibility.

9.8.1. Analysis to investigate the Revised Heterogeneity Hypothesis (1)

The revised heterogeneity hypothesis was based on the principle that some subjects with OCD may have a basal ganglia dysfunction characterised by neurological soft signs, and others would have cognitive-behavioural disturbances characterised by anxiety, guilt and responsibility. A cluster analysis was conducted to determine whether these two separate groups existed.

Since only 24 subjects underwent a neurological soft signs examination, the numbers in this analysis are rather small. Given that some of these subjects did not receive the responsibility questionnaire, rather than lose data, the clusters suggested were those with neurological soft signs, and those with high levels of anxiety and guilt. Any missing values for these variables were replaced with the series mean values of that variable, again to prevent any data being lost owing to missing data points. Demographic details can be found in chapter 7 .

A hierarchical cluster analysis was conducted and the results are shown in Figure 9.4. The Ventrical icicle plot for the variables shows graphically that when two clusters are specified, one cluster comprises NSS, anxiety sensitivity scores, and Beck Anxiety Inventory scores whilst the other comprises guilt totals and the total on the FSAQ. There is no evidence to indicate therefore, that two clusters corresponding to (i) neurological impairment (NSS) and (ii) anxiety/guilt. The large coefficients in the agglomeration schedule indicate that clusters containing quite dissimilar members are being combined.

Figure 9.4. Cluster Analysis to test the Revised Heterogeneity Hypothesis (1)

* P R O X I M I T I E S *

Data Information

24 unweighted cases accepted.

0 cases rejected because of missing value.

Squared Euclidean measure used.

---

* * * * * * H I E R A R C H I C A L C L U S T E R A N A L Y S I S * * * * * *

Agglomeration Schedule using Average Linkage (Between Groups)

Stage	Clusters Cluster 1	Combined Cluster 2	Coefficient	Stage Cluster 1st Appears Cluster 1	Cluster 2	Next Stage
1	1	2	4928.000000	0	0	2
2	1	5	8716.250000	1	0	4
3	3	4	92076.843750	0	0	4
4	1	3	585574.43750	2	3	0

* * * * * * H I E R A R C H I C A L C L U S T E R A N A L Y S I S * *
* *

Cluster Membership of Cases using Average Linkage (Between Groups)

		Number of Clusters		
Label	Case	4	3	2
ASI Total	1	1	1	1
BAI	2	1	1	1
FSAQ Total	3	2	2	2
GUILT Total	4	3	3	2
NSS Total	5	4	1	1

* * * * * * H I E R A R C H I C A L C L U S T E R A N A L Y S I S * *
* *

Vertical Icicle Plot using Average Linkage (Between Groups)

(Down) Number of Clusters (Across) Case Label and number

```
   G   F   N   B   A
   U   S   S   A   S
   I   A   S   I   I
   L   Q
   T

    4   3   5   2   1
1  +XXXXXXXXXXXXX
2  +XXXX   XXXXXXX
3  +X   X   XXXXXXX
4  +X   X   X   XXXX
```

9.8.2. Analysis to investigate the Revised Heterogeneity Hypothesis (2)

The revised heterogeneity hypothesis was based on the principle that some subjects with OCD may have a basal ganglia dysfunction characterised by neuropsychological deficits of errors on the Money Road Map Test and Block Design, and others would have cognitive-behavioural disturbances characterised by anxiety, guilt and responsibility. A cluster analysis was conducted to determine whether these two separate groups existed.

Given that some of the 47 subjects who received a neuropsychological assessment did not receive the responsibility questionnaire, rather than lose data, the clusters suggested were those with neuropsychological impairments, and those with high levels of anxiety and guilt. Any missing values for these variables were replaced with the series mean values of that

variable, again to prevent any data being lost owing to missing data points. Demographic details of these subjects are found in chapters 3, 4, 5 and 8.

A hierarchical cluster analysis was conducted and the results are shown in Figure 9.5. The Ventrical icicle plot for the variables shows graphically that when two clusters are specified, one cluster comprises scores on the Block design, Money errors, anxiety sensitivity scores, and Beck Anxiety Inventory scores whilst the other comprises guilt totals and the total on the FSAQ. There is no evidence to indicate therefore, that two clusters corresponding to (i) neuropsychological impairment (Block design and Money errors) and (ii) anxiety/guilt. The large coefficients in the agglomeration schedule indicate that clusters containing quite dissimilar members are being combined.

Figure 9.5. Cluster Analysis to test the Revised Heterogeneity Hypothesis (2)

```
* * * * * * * * * * * * * * * P R O X I M I T I E S * * * * *

Data Information

        47 unweighted cases accepted.

         0 cases rejected because of missing value.

Squared Euclidean measure used.

* * * * * * H I E R A R C H I C A L  C L U S T E R  A N A L Y S I S * * * * * *
```

Agglomeration Schedule using Average Linkage (Between Groups)

Stage	Clusters Combined Cluster 1	Cluster 2	Coefficient	Stage Cluster 1st Appears Cluster 1	Cluster 2	Next Stage
1	1	4	9668.134766	0	0	2
2	1	5	13574.066406	1	0	3
3	1	6	30889.359375	2	0	5
4	2	3	171381.79688	0	0	5
5	1	2	1110921.1250	3	4	0

* * * * * * H I E R A R C H I C A L C L U S T E R A N A L Y S I S * *

* *

Cluster Membership of Cases using Average Linkage (Between Groups)

Number of Clusters

Label	Case	5	4	3	2
BAI	1	1	1	1	1
FSAQ Total	2	2	2	2	2
GUILT Total	3	3	3	3	2
ASI Total	4	1	1	1	1
BLOCK	5	4	1	1	1
MONEY ERRORS	6	5	4	1	1

* * * * * * H I E R A R C H I C A L C L U S T E R A N A L Y S I S * *

* *

Vertical Icicle Plot using Average Linkage (Between Groups)

(Down) Number of Clusters (Across) Case Label and number

```
      G   F   M   B   A   B
      U   S   O   L   S   A
      I   A   N   O   I   I
      L   Q   E   C
      T   T   Y   K

      3   2   6   5   4   1
  1 +XXXXXXXXXXXXXXXXX
  2 +XXXX   XXXXXXXXXX
  3 +X   X   XXXXXXXXX
  4 +X   X   X   XXXXXXX
  5 +X   X   X   X   XXXX
```

9.9. Summary

The original heterogeneity hypothesis could not be tested, as one of the two suggested sub-groups was not homogeneous. Testing two revised theories of heterogeneity did not fulfil the hypothesis that separate sub-groups existed within OCD, one characterised by a basal ganglia deficit, and the other characterised by cognitive-behavioural dysfunctions

9.10. Discussion: the heterogeneity of heterogeneity

As stated in section 9.1, different types of heterogeneity may exist. This study would seem to exclude homogeneous sub-groups based on deficits suggested to reflect basal ganglia dysfunction and characteristics of anxiety and guilt. However, it may be that heterogeneity of this sort does exist, but that this study failed to detect it. Failure to determine two distinct sub-groups may have arisen for a number of reasons. Firstly, the sample sizes were small for cluster analyses of this sort. Ideally, hundreds of subjects with neurological soft sign assessments, neuropsychological and psychological assessments would have been included in the study. Since only Senior Neurologists are able to carry out neurological soft signs assessments (and few neurologists have the time to devote to projects on a disorder which is not characterised by obvious neurological impairment), this is impractical. Alternatively, given the problem that neither neurological soft signs, nor neuropsychological assessments can act as 'lesion detectors', it may be that the assessments failed to detect basal ganglia dysfunction. nMRI or PET scanning would overcome this problem, although given the high pressure for these machines, and the expense, it is unlikely that the high number of subjects needed to test the heterogeneity hypothesis would be able to have such a scan at present.

Another possible reason that heterogeneity was not found could be a bias in

recruitment of subjects. Many of the subjects were recruited through self-help groups and advertisements in women's magazines. It may be that people who had problems with anxiety were more likely to attend such a group and respond to an advertisement. However, an attempt was also made to recruit subjects through the Tourette's Syndrome Society, but no subjects were suitable for the study (i.e. had OCD, were relatives of Tourette's probands but had no tics themselves). Therefore, whilst this study does not categorically exclude the possibility that two heterogeneous sub-groups of the type hypothesised do exist, no support for this hypothesis was found.

Other types of heterogeneity such as phenomenological heterogeneity may exist. This type of heterogeneity has been referred to implicitly throughout this thesis. It would seem, for example, that excessive responsibility is more closely associated with checking behaviour than washing behaviour (see chapter 5). Similarly, guilt and thought-action fusion appear to be more closely related to checking than washing behaviour. Differences between checkers and washers were reviewed and the data from this thesis appear to support a distinction between them. However, less research has been done on people with other, more unusual, obsessional difficulties such as compulsions of symmetry and hoarding. It may be that people with hoarding difficulties are more akin to checkers than washers.

Alternatively, rather than viewing sub-groups as distinct categories, Hollander (1993) and Tallis (1995) suggest that a dimensional approach may be more appropriate. Given the continuum between normal and abnormal obsessions (Rachman and de Silva, 1978; Salkovskis and Harrison, 1984), this approach would seem more appropriate. Hollander's dimensional aspects can be seen in Figure 9.6. It should be noted that this dimensional approach of risk-aversive to risk-seeking behaviours is not considered incompatible with the spectrum organisation shown in Figure 9.1. Other dimensions suggested by Hollander include

dimensions from cognitive to motor behaviours (obsessional ruminations falling at one end of the spectrum, Tourette's falling at the other), and from uncertainty to certainty (OCD at the 'uncertainty' end, Body dysmorphic disorder at the 'certainty' end.)

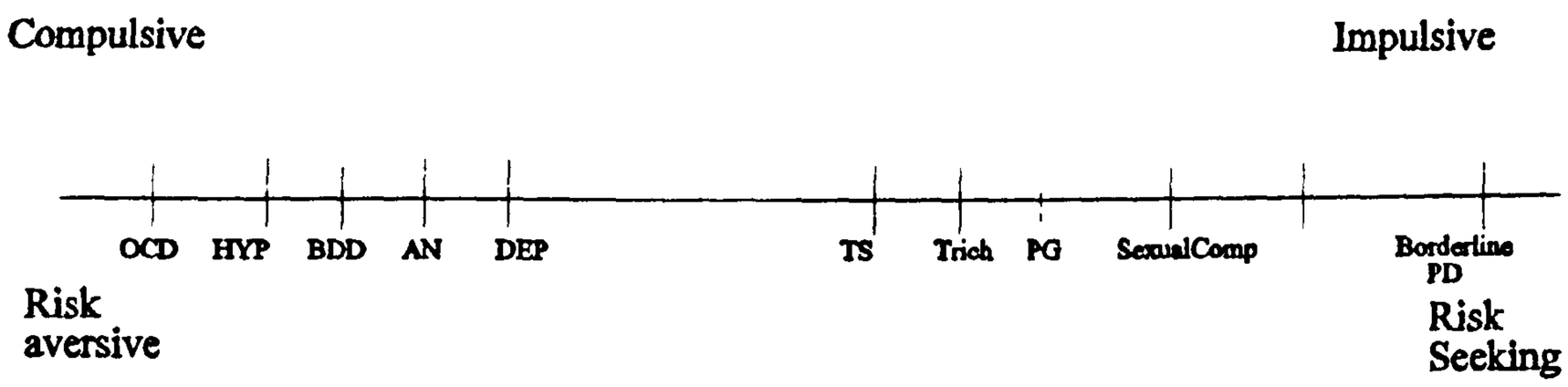


Figure 9.6. Dimensional aspects of the obsessive-compulsive-related disorder spectrum (Hollander, 1993): risk-aversive/risk-seeking dimension. This dimension, from left to right, goes from, 'compulsive (risk aversive) disorders' to 'mixed compulsive-impulsive disorders' to 'impulsive (risk-seeking) disorders' as follows: obsessive-compulsive disorder (OCD), hypochondriasis (HYP), body dysmorphic disorder (BDD), anorexia nervosa (AN), depersonalization disorder (DEP), Tourette's syndrome (TS), trichotillomania (Trich), pathological gambling (PG), sexual compulsions (Sexual Comp), and borderline and antisocial personality disorders (Borderline PD).

The dimensions suggested by Hollander are interesting, but are poorly integrated with each other, and with his conceptualisation of the spectrum's distinct but overlapping subgroup shown in Figure 9.1. Clinical features, age at onset, clinical course, family history, and comordidity are all suggested to be common to OCD and its 'related' disorders and the aetiology is presumed, in all cases, to be 'biology and neurology' (p.4). The absence of depression and anxiety disorders as belonging to the same dimension is astonishing given the finding that 80% of OCD patients are depressed according to Beck's depression inventory and that 30% have received a lifetime diagnosis of comorbid major depression (Rasmussen and Eisen, 1991).

Tallis (1995) has made an attempt to integrate the neurological literature on OCD with the psychological literature, also using a continuum. It is suggested that OCD which is characterised by neurological impairment forms one end of a continuum (rather than a homogeneous subgroup) and that people whose compulsive behaviour is associated with learning experiences, idiosyncratic beliefs and appraisals are at the other end. The majority of OCD patients are considered to 'occupy the middle ground. That is, their symptoms are the product of both biological and experiential factors in equal or differential measures'. Tallis regards the need to think of OCD in terms of distinct sub-groups as limiting and impoverishing our understanding of such a complex disorder.

The model of the control of thought and action (Norman and Shallice, 1980) is suggested by Tallis to integrate the neurological and cognitive-behavioural theories of OCD.

The model is based on the position that cognition and action depend on the operation of highly specialised programmes or schemas, each of which produces a specific output for a range of inputs. Perceptual information and output from other schemata, trigger the schemata to control a specific overlearned action. Owing to space limitations, this model will not be

described in more detail. In brief (and simplifying), Tallis (1995) suggests that a negative intrusive thought is appraised by someone with OCD in terms of danger. This 'danger appraisal' results in the interruption of ongoing behaviour by a `supervisory attentional system' (SAS). The SAS controls reparative or preventative behaviour which, for OCD patients, takes the form of compulsions. Appraisals and beliefs affect the salience of intrusive thoughts which are considered, in turn, to affect the SAS (via 'contention scheduling'). However, 'biological' factors are considered to affect 'contention scheduling' and the SAS .

This is an interesting hypothesis and, in essence, suggests that there are different pathways to the aetiology of OCD. One of the difficulties with this hypothesis is that it is not readily testable, but some predictions do arise from the model, for example, manipulating the salience of the intrusion should lead to changes in compulsive activity.

In summary, the hypothesised type of 'heterogeneity' was not supported in this data set, and it may be better to return to a symptom-based investigation of heterogeneity. What is agreed, however, is that it is unlikely that there will be a single, simple cause of a disorder as complex as OCD.

'It may be most parsimonious to think of OCD as a disorder involving several etiologies that share a common route of expression' (Winslow and Insel, 1991).

CHAPTER 10

Discussion and Conclusions

10.1. Introduction

This chapter summarises the main findings of the studies on anxiety, guilt, religion, responsibility, thought-action fusion (TAF), neurological soft signs, neuropsychological assessment and the heterogeneity hypothesis. The current status of the cognitive-behavioural model, the neurological deficit model and the heterogeneity hypothesis are considered. A number of theoretic developments of the cognitive-behavioural model are discussed, including the refinement of perceived responsibility for threat, the suggestion of two different types of guilt, the improved understanding of the bias of TAF, and predictions concerning the relationship among TAF, responsibility, guilt and obsessional phenomenology. A model of the suggested relationships among these variables is given. The clinical implications of some of the findings from the thesis are reviewed. Future work - both theory and clinically oriented - is suggested. The thesis ends with a final paragraph which draws some overall conclusions from the studies undertaken.

10.2. Brief Summary of Main Findings

10.2.1. Anxiety

Anxiety is at the core of the behavioural model of OCD. An investigation into anxiety in OCD patients found elevated levels of anxiety in this population, compared with non-clinical populations. OCD patients scored higher on all subscales of the Four Systems Anxiety Questionnaire than data published for the normal population, and showed significantly more 'fear of fear'. There was a relationship between anxiety and some, but not all, measures of

obsessionality.

10.2.2. Religion and Guilt

Guilt plays an important role in the cognitive-behavioural model of OCD and is part of the clinical presentation of the disorder. However, research in this area has produced conflicting findings. In this questionnaire study, obsessional subjects had higher trait and state guilt than published norms, although they did not have higher moral standards. Trait and state guilt were found to be associated with OCD symptomatology, but moral standards were not. The associations of trait and state guilt with OCD symptomatology were altered after controlling for the effects of depression and anxiety. Trait guilt, depression and anxiety continued to predict scores on measures of obsessionality. There were no differences in reported guilt between people with washing compulsions and those with checking difficulties.

One possible reason for elevated guilt in OCD may concern religion, and clinically the role of religion appears to be important to some obsessional difficulties. Religious beliefs and religious morality may be a means by which normal intrusive thoughts are given special significance. A questionnaire study into the role of religion in OCD found that the level of religion was not associated with OCD symptoms, but the conflict between obsessional symptoms and the moral code of the religion was associated with OCD symptomatology.

10.2.3. Responsibility

The role of perceived responsibility is fundamental to the cognitive-behavioural theory of OCD. Three studies investigated the role of responsibility in OCD. In the first study, an association was found between pathological responsibility and obsessionality, depression and anxiety. The association between pathological responsibility and checking and rumination was

maintained when the effects of anxiety were partialled out of the correlational analyses. The next study aimed to develop a questionnaire of general responsibility. No significant relationship between obsessional behaviour and responsibility for harm, social responsibility or positive responsibility was found. However, a significant relationship was found between the subscale of thought-action fusion and obsessional symptoms. This subscale was related to depression, state guilt and trait guilt. There was a significant negative association between positive responsibility, and trait guilt and depression scores, and between responsibility for harm and guilt standards. No relationship was found between responsibility for harm or social responsibility subscales, and scores of depression, state guilt and trait guilt.

The final study involved an indirect manipulation of responsibility by varying the presence of the experimenter. In summary, the manipulation was successful. In the high responsibility condition (subject alone) exposure + response prevention led to a stronger urge to neutralise, more discomfort and increased estimates of the probability of threat compared to the low responsibility condition (subject + experimenter). There were no differences between perceived control over threat and perceived responsibility for thoughts between the two conditions. There were also no differences between the experience of fear cognitions and body sensations between the two conditions.

10.2.4. Thought-Action Fusion

Thought-Action fusion (TAF) was suggested to be a cognitive bias that could serve to influence the significance of intrusive thoughts. A highly reliable questionnaire was designed to assess TAF. The factor solution for TAF was broadly similar in both a student and obsessional population and identified both likelihood and moral TAF. However, the factor solutions differed when a 3-factor solution was extracted. There was a positive

association between TAF and measures of obsessionality in both the student and obsessional populations. TAF was particularly associated with checking behaviour, responses to unwanted images and impulses, and responses to a negative thought. Likelihood TAF was stronger in those with checking behaviours than those with washing compulsions.

10.2.5. Neurological Soft Signs

Neurological soft signs have been used to detect areas of the brain which may have a lesion. There is considerable debate as to whether neurological soft signs have this 'localising' ability. In the study carried out, patients with OCD had more neurological soft signs than groups of normal subjects (published data), particularly signs of impaired sensory integration and motor co-ordination. OCD subjects had fewer neurological soft signs than groups of people with schizophrenia whose data have been published. It is important to have anxiety control groups in order to determine the specificity of NSS in psychiatric disorders.

10.2.6. Neuropsychological Deficits

Neuropsychological deficits have again been used as 'lesion detectors', even though data from neuropsychological tests cannot inform about areas of dysfunction. No neuropsychological deficits were found in tests of visuo-spatial or executive function, once the effects of anxiety, intelligence and speed were taken into account.

10.2.7. The Heterogeneity Hypothesis

It was suggested that there may be two homogeneous sub-groups within OCD, one characterised by neurological dysfunction, and the other characterised by excessive anxiety, responsibility and guilt as indicated by the cognitive-behavioural model. Correlational

analyses did not support the hypothesis that neurological soft signs and neuropsychological test performance formed a homogenous sub-group, as there was no significant relationship found between these measures, suggested to indicate basal ganglia dysfunction. The heterogeneity hypothesis was revised, but cluster analyses did not support the hypothesis that two distinct sub-groups existed, one characterised by neurological soft signs OR neuropsychological deficits, the other by anxiety and guilt. It was concluded that, although different types of heterogeneity may exist, there was no evidence for the heterogeneity hypothesis defined in this thesis.

10.3. Current Status of the Neurological and Cognitive-Behavioural Models, and the Heterogeneity Hypothesis

10.3.1. Current Status of the Neurological Model

This thesis investigated the neurological model of OCD by examining the neurological soft signs and neuropsychological deficits present in patients with the disorder. These investigations are by no means comprehensive, and are unable to distinguish between the types of basal ganglia/frontal loop deficits suggested by Wise and Rapoport (1989, Modell (1987) and Baxter (1990). Furthermore, neither of these techniques enjoys a 1:1 relationship with the presence of specific basal ganglia dysfunction and deficits on these tests may arise for a number of reasons, including symptoms of OCD.

Nevertheless, if anything, the difficulties with the investigative tools would lead to a false positive identification of deficits, rather than a false negative. In this study, no neuropsychological deficits were found, once important variables such as speed, intelligence and anxiety were considered. Although neurological soft signs were more prevalent in this

group than data published for groups with no psychiatric history, these signs were not associated with OCD symptomatology. In this study, people with OCD were significantly slower on a speed task. Hence whilst the investigations cannot rule out the possibility that basal ganglia dysfunction is present in OCD, it is equally plausible to suggest that the symptoms of OCD are themselves leading to an increase in the number of neurological soft signs present. Future studies in this area should employ a control group of patients with anxiety disorder.

In summary, the methods used in this study did not find any evidence to support the basal ganglia model of OCD.

10.3.2. The Status of the Cognitive-Behavioural Model of OCD

This thesis provided findings which not only tested the cognitive-behavioural model of OCD, but may have elucidated some of the mechanisms by which intrusive thoughts attain 'special significance'. Unsurprisingly, anxiety was found to characterise the disorder, but data were provided showing the importance of guilt in relation particularly to checking. 'Religiosity' per se did not seem to be associated with obsessional symptoms, but the degree of conflict between obsessional problems and the moral code provided by one's religion was associated with obsessional symptomatology.

This conflict is in keeping with Salkovskis's cognitive-behavioural formulation of OCD, in which intrusive thoughts, which occur to the majority of the population, assume overwhelming importance to some people (Salkovskis, 1985). It may be that a personal interpretation of a violation of a religious code by an intrusive thought leads to guilt, anxiety and the need to 'set matters right' via neutralisation. This may be a reason why the level of morality, as assessed by the moral standards sub-scale of the 'Guilt Inventory' (Kugler and

Jones, 1992,) is not related to obsessionality. It may be the violation of moral codes, not the absolute strictness of them, that is important in the aetiology and maintenance of OCD.

The investigation of perceived responsibility in OCD was particularly fruitful, both from the point of view of positive and negative findings. The general measure of responsibility, developed in Vancouver, did not appear to be associated strongly with obsessional symptoms in a normal population. This indicated that the model may have to specify more closely the types of inflated responsibility that may be present in this group. A more specific, pathological, measure of responsibility was closely associated with obsessional symptoms, and with guilt; these associations could not be accounted for in terms of anxiety or depression. One of the most interesting findings from the earlier 'failed' general measure of responsibility was that one subscale did appear to be related to obsessional symptoms. This subscale was developed and led to the 'Thought-Action Fusion' questionnaire.

The work on TAF has perhaps been the most exciting of the thesis, as it is new area. Not all people with OCD have this bias, but the study indicated that some people with OCD believe that thinking something makes it more likely to happen, and that thinking something is the moral equivalent (almost) as doing it. TAF may be a mechanism by which thoughts are given 'special significance', leading to increased responsibility.

One of the difficulties in presenting the work of the thesis in separate chapters is that all the variables - guilt, anxiety, responsibility and TAF- are linked together. Section 6.10 draws together the findings to present a cognitive-behavioural mechanism that could lead to and maintain OCD.

In summary, the data supported the cognitive-behavioural modification of OCD, with further modifications concerning the generality of perceived excessive responsibility.

10.3.4. The Status of the Heterogeneity Hypothesis

The findings did not support the heterogeneity hypothesis in either its original or revised form. It is probably not worth pursuing this particular form of heterogeneity without the use of brain scans to facilitate the localisation of dysfunction in the basal ganglia or frontal loop. However, it is vital in studies of this sort to have adequate anxiety control subjects in order to control for the effects of anxiety and other OCD symptoms on cerebral blood flow. Other types of heterogeneity, based on symptoms, may be more profitably investigated.

10.4. Developments of the Cognitive-Behavioural Model

10.4.1. Theoretical Developments

The findings of the thesis have contributed to the theoretical development of the cognitive-behavioural model. The three most important contributions may be:

(i) The refinement of perceived responsibility for threat;

(ii) The suggestion of two different types of guilt - depressive and obsessional - and the relationship between different types of guilt, obsessional phenomenology and depression (see chapter 5);

(iii) The improved understanding of the bias of thought-action fusion;

(iv) Predictions concerning the relationship among TAF, responsibility, guilt and obsessional phenomenology

10.4.1.1. Refinement of Perceived Responsibility for Threat

The cognitive-behavioural model places responsibility for threat at the heart of obsessional difficulties. However, a questionnaire study (chapter 5) did not identify a relationship between obsessional difficulties and general responsibility for harm and social

responsibility. The conclusion of the study was that the current role of responsibility in the model is too broad and is untenable. The situations in which people with obsessional difficulties appear to have excessive perceived responsibility threat are typical obsessional situations such as checking the doors to make sure they are locked and thus prevent a burglary; checking to make sure that no-one has been knocked over etc. However, the suggestion that these people would also feel that it was their responsibility to protect everyone from harm (as opposed to loved ones) in all potentially harmful situations was not supported. It may also turn out to be the case that, whilst a person feels excessively responsible one day for a particular threat (perhaps owing to an intrusive thought), the person may not feel the same degree of responsibility on a different day (perhaps when he/she have not had such an intrusion). The change in overt obsessional behaviours with changes in covert mental states when situations are apparently stable has been noted elsewhere (Shafran and Thordarson, 1995).

10.4.1.2. Guilt, obsessions and depression

One of the interesting findings from the studies on guilt and responsibility was that, although guilt levels did not differ between people with checking and people with cleaning compulsions, perceived responsibility for threat was higher in the former population. Since guilt is suggested to arise from a negative event for which a person feels responsible (see chapter 3), it may be that the instrument used (the Guilt Inventory; Kugler and Jones, 1992) was not sensitive enough to detect differences in the types of guilt experienced by those with checking and those with cleaning compulsions. It was suggested that the former may have obsessional guilt resulting from perceived responsibility for a negative event, while those with cleaning compulsions experience guilt for failing to live up to moral (or other standards). This

hypothesis is testable. Another prediction is that someone with checking compulsions would develop washing compulsions after an episode of depression; and a person with washing compulsions may develop checking difficulties if perceived responsibility for a negative event were elevated in some way.

10.4.1.3. The improved understanding of the bias of thought-action fusion

This bias was first identified by Jack Rachman in 1993 and had not been open to empirical investigation before the studies reported in this thesis. The two types of TAF - moral and likelihood - may have different influences, depending on the obsessional difficulties. As in the work on responsibility, the suggestion that all people with obsessional difficulties have this type of bias was not supported by the research. Rather, some people in some situations may show this tendency. The moral type of TAF was equally associated with washing and checking compulsions, but the likelihood TAF was more strongly associated with checking difficulties. This is consistent with the work on responsibility: it is plausible that the greater the likelihood TAF, the greater the perceived responsibility for the event. If perceived responsibility for threat is primarily associated with checking as opposed to washing compulsions, there will be a stronger relationship between likelihood TAF (via perceived responsibility for threat) and checking behaviour than likelihood TAF and washing compulsions.

The identification of likelihood TAF implies that both Carr's (1974) analysis and Salkovskis's (1985, 1989) analysis can be considered to apply to obsessional difficulties. Carr (1974) suggested that people with OCD over-estimate the possible risk of threat, whereas Salkovskis suggested that the problem lies not with risk estimation for threat, but with an over-estimation of the probability of being responsible for threat. If a person had the bias of

TAF, this would lead to *both* an over-estimation of the probability of risk (e.g. thinking something makes it more likely to happen; I have thought it, it is therefore more likely to happen) *and* an over-estimate of the probability of being responsible for threat (e.g. I have thought it and therefore if the threat materialisers, it will be my fault).

10.4.1.4. Predictions concerning the relationship among TAF, responsibility, guilt and obsessional phenomenology

A variety of predictions have been made concerning the relationship between TAF, responsibility, guilt and obsessional complaints. For example, cleaners/washers with high perceived responsibility for threat will be concerned about contaminating others as well as themselves, and are more likely to have checking compulsions than those with low perceived responsibility for threat (see chapter 5). It has also been suggested that depression can act as a 'conductor' facilitating the development of checking compulsions in someone who has cleaning difficulties (especially if that person has high perceived responsibility for threat). A model which summarises the relationship between these variables is shown in figure 10.2 and gives rise to these testable predictions.

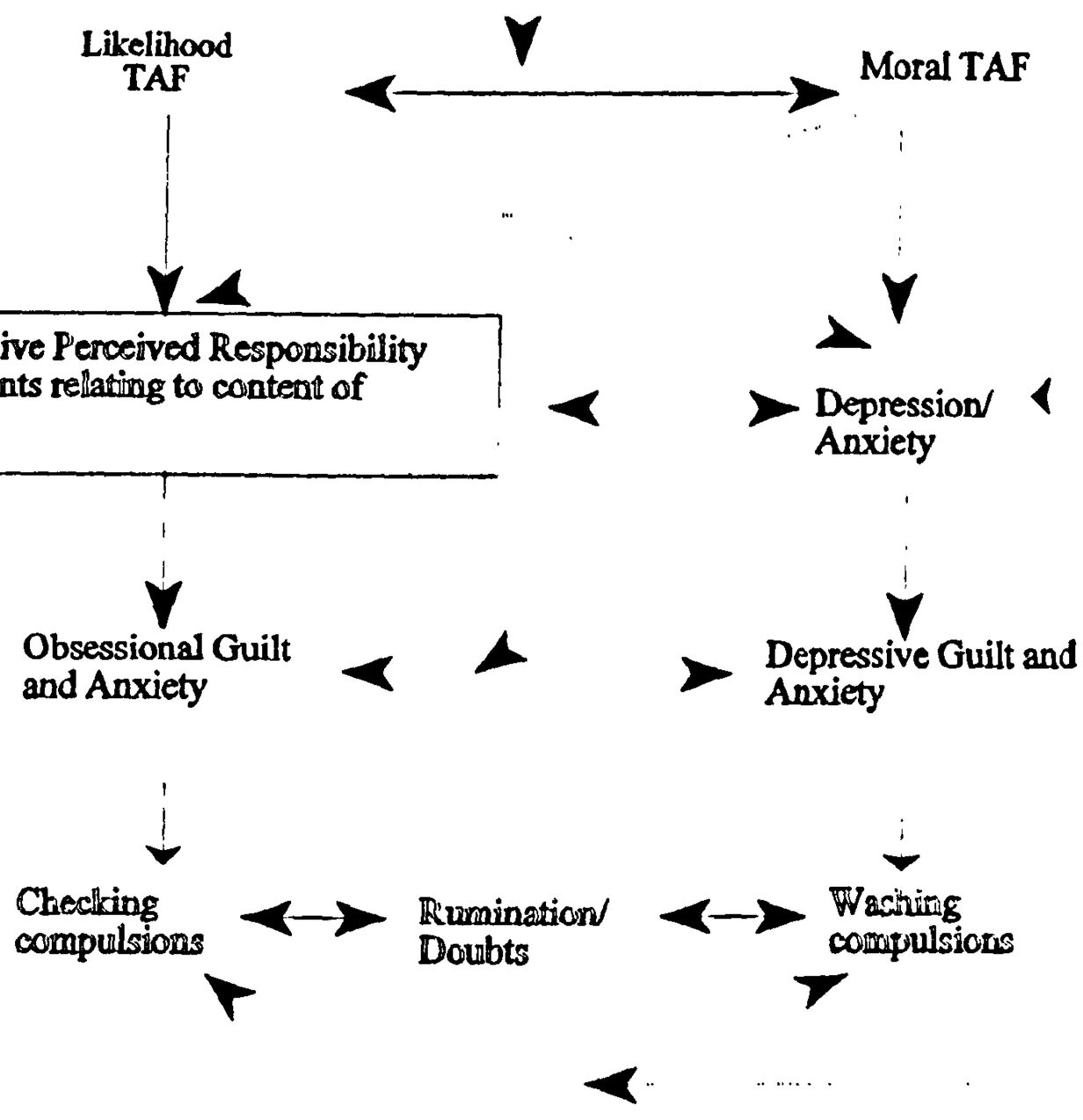


Figure 10.2. TAF, responsibility, guilt, depression and obsessional difficulties: a model of their inter-relationships.

10.4.2. Clinical Implications

There are direct clinical implications deriving from the suggested model, and the work done during the thesis. The work on anxiety implies that treatment of anxiety within OCD should focus on all types of anxiety - cognitive, behavioural, feelings and somatic. The sort of guilt that a person may be experiencing - obsessional or depressive, state or trait - may also have implications for treatment. It may be that an exposure and response prevention programme should incorporate prevention of restorative action when a person feels guilty in a variety of situations. It may be that, for some people, the motivation to perform the compulsion is to alleviate (or prevent) guilt rather than anxiety, and that feelings of guilt may be subject to the same process of habituation as anxiety. If this is the case, then a graded hierarchy of exposure with response prevention relating to guilt, as opposed to anxiety, could

be implemented. It may be that a person does not find it too guilt provoking, for example, to shut the door in the face of the therapist without apologising; however, shutting the door in the face of a child or elderly person without apologising may cause more guilt/anxiety but this may decline naturally in the course of time, in a similar manner to the habituation of anxiety (see Rachman and Hodgson, 1980).

The work on the conflict between obsessional difficulties and the moral code of the religion also has therapeutic implications. It may be that exploring beliefs about the nature of the conflict and the violation caused by obsessional difficulties would reveal a belief system which is maintaining the obsessional difficulties.

Perhaps the most important clinical implications arise from the work on responsibility. Although a group behavioural treatment approach may be helpful to people with washing compulsions, such a treatment may be less beneficial to those who check compulsively, since it is likely to be more difficult to obtain the degree of anxiety necessary for exposure + response prevention in a setting with such highly responsible people! Similarly, behavioural treatment for people with checking compulsions is best done in the absence of the experimenter in a situation (such as the home) where the person feels most responsibility. Asking a patient about feelings of responsibility and guilt has been found to be therapeutic in several cases (Rachman, 1993; personal communication).

Identification of TAF has important clinical implications. One of the reasons that cognitive therapy for OCD has been less effective than predicted by the model (see James and Blackburn, 1995, for a review) may be that the cognitive theory has been insufficiently developed. A person may carry a range of specific TAF beliefs in obsessional situations that are not being tapped by traditional cognitive therapy in which general beliefs about responsibility, self, world and others are being addressed. The outcome of cognitive-

behavioural therapy may be improved for some patients by identifying and challenging beliefs about TAF.

10.5. Future Work

The thesis has given rise to a series of speculations and suggestions which should be tested empirically. An important target is the identification of the specificity of both excessive perceived responsibility for negative events and TAF. Although questionnaire studies are an important first step to identifying and measuring beliefs, experimental analyses are needed to extend and elaborate the concepts. Ethically, it is difficult to manipulate perceived responsibility for threat in non-clinical and clinical populations. Similarly, experiments in which subjects think or write down 'I hope that my mother dies in a car crash tonight' may evoke the required degree of anxiety and may give rise to neutralising behaviours, but are not ethical.

One experimental study that has been designed jointly between myself and the Rachman research team and is currently being conducted in Vancouver investigates further the cognitive biases in a normal population. The study aims to assess cognitive biases concerning the relationships among responsibility for an event, thoughts about the event, the probability of the event occurring and the extent of control over the event. TAF is investigated under situations of high responsibility, and low responsibility. The experimental procedure is as follows:-

Normal subjects who show TAF in at least one situation (as assessed by the TAF questionnaire) will be asked to write a sentence stating that they hope a second researcher has fallen down the stairs and hurt herself. This sentence is written under three conditions: high responsibility for the event, low responsibility for the event, and a control condition in which

responsibility is not changed. Manipulation of responsibility occurs by means of a contract. Questions about responsibility, probability and control will be asked before and after the responsibility manipulation. It is predicted that in the high responsibility condition, likelihood TAF will be stronger than in the low responsibility condition. At the end of the experiment, it is emphasised that subjects are no longer responsible for any events that may happen to the second researcher. The contracts are destroyed in front of the subject, as is the written sentence.

Future experiments will aim to determine the fear-evoking properties of TAF, and will be comparable with earlier experiments designed to explore the nature of compulsive behaviour (see Rachman and Hodgson, 1980). Neutralising behaviour will be used as an objective, overt behavioural measure of the effects of manipulating TAF. Experiments will investigate the effects on neutralising a TAF statement with

- **'mental' vs 'physical' neutralising**
- **a time delay**
- **thought suppression**
- **transferring responsibility for a negative outcome**
- **transferring responsibility for neutralising**

The experimental findings concerning transference of responsibility and the effects of delay, thought suppression and type of neutralising will be extended to the clinic. Cognitive strategies based on the empirical data will be developed with the aim of improving cognitive therapy for OCD and reducing the neutralising behaviour in a clinical population.

Some possible translation to the clinic are:-

- **Reduction of neutralising behaviour**
- **Changing neutralising behaviour so that it is effective but benign**
- **Separation of thoughts from actions**
- **Reduction of responsibility**

Funding has been obtained in the form of a Killam Fellowship and this future work will be conducted in collaboration with Professor Rachman at the University of British Columbia.

10.6. *Overall Conclusions*

The work in the thesis has provided a mixture of positive and negative findings. The original aims were to test and expand the cognitive-behavioural model , and to try to find a way that of reconciling it with a neurological deficit model via a hypothesis of 'heterogeneity'. The investigations of the cognitive-behavioural model have been particularly fruitful, but there was no evidence to support the heterogeneity hypothesis and the two theories thus remain unreconciled. The divide between the psychological and neurological aspects of OCD in the literature holds strong, with a recent book on 'Current Insights into Obsessive-Compulsive Disorder' (Hollander et al., 1994) failing to mention cognitive, behavioural or any other psychological theory despite a chapter on leucotomy. Acknowledgment of the different approaches is the first step that is required for integration, if the evidence supporting both models continues to flourish. Alternatively, it may be that cumulative evidence will support one model in preference to the other. Studies examining both models and their possible integration are needed to shed light on such a debilitating and complex disorder.

POST-SCRIPT

" I would just like to say how pleased I am about the work you are doing with OCD. I have had OCD for about 21 years and have been hoping for further research for years. You really are giving people like me hope for a more normal life" (JW).

"I will gladly help with your research because I understand I am not the only one who needs help from this imprisonment. I cannot live the rest of my life like this.. I would do anything to be normal and free of the daily hell of it" (KW).

"I thought I would write and thank everyone at the Psychiatric Department for your hard work and research into OCD...When I arrived at the meeting and saw all of the people who are like me and have OCD it was such a relief. It was just like meeting a family I knew I had, but had never met before this day. Throughout the day I felt many emotions: I laughed, I cried, but most of all, I felt safe for the first time in years. When I feel isolated or frightened, I will look back on the memory of meeting 'my family' and treasure the feeling and gain comfort from this...Thankyou for researching OCD" (DC).

"Thankyou for taking an interest in this life-restricting fixation" (GB).

"My thanks to all you wonderful people who are working so hard to help us" (JP).

"Thank you for taking time to read my letter" (KG).

REFERENCES

Abel, J. (1993). Exposure with Response Prevention and Serotonergic antidepressants in the treatment of Obsessive-Compulsive Disorder: A review and implications for inter-disciplinary treatment. Behaviour Research and Therapy, 31 (5), 463-478

Adams, R.M., Koccsis, J.J., and Estes, R.E. (1974). Soft neurological signs in learning disabled children and controls. American Journal of Disease in Childhood, 127, 614-618.

Akhtar, S. Wig, N.H. Verma, V.K. Pershod, D. and Verma, S.K. (1975). A phenomenological analysis of the symptoms of obsessive-compulsive neuroses. British Journal of Psychiatry, 127, 342-48.

Alarcon, R.D., Libb, J.W., Boll, T.J. (1994). Neuropsychological testing in obsessive-compulsive disorder: a clinical review. Journal of Neuropsychiatry and Clinical Neuroscience, 6 (3), 217-28.

Ameline, D. (1901). Considerations sur la Psycho-Physilogie des Obsessions et Impulsions Degeneratives. 4th International Congress of Psychologie. Paris, Comptes Rendus, 572-578

American Psychiatric Association (1987). Diagnostic and Statistical Manual of Mental Disorders, 3rd Edition Revised, Washington, D.C: American Psychiatric Association.

American Psychiatric Association (1994). Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Washington, D.C: American Psychiatric Association.

Anthony, J.C., Folstein, M., Romanoski, A.J. et al. (1985). Comparison of lay Diagnostic Interview Schedule and a Standardized Psychiatric Diagnosis: Experience in Eastern Baltimore. Archives of General Psychiatry, 42, 667-675.

Aronowitz, B.R., Hollander, E., DeCaria, C., Cohen, L., Saoud, J.B., Stein, D., Liebowitz, M.R., Rosen, W.G. (1994). Neuropsychology of Obsessive-compulsive Disorder: Preliminary Findings. Neuropsychiatry, neuropsychology and Behavioural Neurology, 7 (2), 81-86.

Baer, L. (1994). Factor Analysis of Symptom Subtypes of Obsessive Compulsive Disorder and Their Relation to Personality and Tic Disorders. Journal of Clinical Psychiatry, 55 (3) supplement, 18-23.

Baer, L., Jenike, M.A., Black, D.W. et al. (1992). Effect of axis II diagnoses on treatment outcome with clomipramine in 55 patients with obsessive compulsive disorder. Archives of General Psychiatry, 49, 862-866.

Ball, B. (1892). Des obsessions en pathologie mentale. Ann Psychitr. Hypnolog 2:1-15

Barr, L.C., Goodman, W.K., Price, L.H., McDougle, C.J., and Charney, D.S. (1992). The serotonin hypothesis of obsessive-compulsive disorder: implications of pharmacologic challenge studies. Journal of Clinical Psychiatry, 53 (suppl) 17-28.

Baxter, L.R. (1990). Brain Imaging as a Tool in Establishing a Theory of Brain Pathology in OCD. Journal of Clinical Psychiatry, 51, (2), [Suppl] . 22-26

Baxter, L.R., Schwartz, J.M., Guze, B.H., Bergman, K., and Szuba, M.P. (1990). Neuroimaging in OCD: Seeking the Mediating Neuroanatomy. In Jenike, M.A., Baer, L and Minichiello, W.E. (Eds). OCD: Theory and Management. Second Edition Year Book Medical Publishers Ltd. Chapter 13.

Baxter, L., Schwartz, J.M., Bergman, K.S., Szuba, M.P., Guze, B.H., Mazziotta,J.C., Alazraki, A., Selin, C.E., Ferng, H-K., Munford, P., and Phelps, M.E. (1992). Caudate Glucose Metabolic Rate Changes with Both Drug and Behaviour Therapy for Obsessive-compulsive Disorder, Archives of General Psychiatry, 49, 681-689.

Beck, A.T. (1967). Depression: clinical, experimental and theoretical aspects. Harper and Row, New York.

Beck, A.T. (1976). Cognitive therapy and the emotional disorders. International University Press, New York.

Beck, A.T. (1991). Cognitive Therapy: A 30-year Retrospective. American Psychologist, 46 (4), 368-375.

Beck, A., Brown, G., Epstein, N., Steer, R. (1988). An Inventory for Measuring Clinical Anxiety: Psychometric Properties. Journal of Consulting and Clinical Psychology, 56 (6), 893-897

Beck, A.T., Emery, G., and Grennberg, R.L. (1985). Anxiety Disorders and Phobias:A Cognitive Perspective. Basic Books, Harper Collins, USA.

Beck, A.T., Epstein, N., and Harrison, R. (1983). Cognitions, attitude and personality dimensions in depression. British Jounrnal of Cognitive Psychotherapy, 1, 1-16.

Beck, A., Ward, C.H., Mendelson, M., Mock, J., Erbaugh, J. (1961). An Inventory Measuring Depression. Archives of General Psychiatry, 4, 53-63.

Behar, D., Rapoport, J., Berg, C., Denckla, M.B., Mann, L., Cox, C., Fedio, P., Zahn, T and Wolfman, M.G. (1984). Computerized Tomography and Neuropsychological Test Measures in Adolescents with Obsessive-Compulsive Disorder. American Journal of Psychiatry, 141 (3), 363-369.

Benton, A.L. (1974). The Revised Visual Retention Test (4th edition). New York: Psychological Corporation

Berrios, G.E. (1989). Obsessive-compulsive Disorder: Its Conceptual History in France during the 19th Century. Comprehensive Psychiatry, 30 (4) 283-295.

Berrios, G.E., Bulbena, A., Bakshi, T.R., Dening, A., Jenaway, H., Markar, H., Martin-Santos, R., and Mitchell, S.L. (1992). Feelings of Guilt in Major Depression: Conceptual and Psychometric Aspects. British Journal of Psychiatry, 160, 781-787 .

Black, D.W., Nayes, R., Goldstein, R.B. and Blum, N. (1992). A family study of Obsessive-compulsive disorder. Archives of General Psychiatry, 49, 362-368.

Bolton, D. (1995). Annotation: Developmental Issues in Obsessive-Compulsive Disorder. Journal of Clinical Child Psychology, In Press.

Bolton, D., and Turner, T (1984). Obsessive-compulsive neurosis with conduct disorder in adolescence: a report of two cases. Journal of child Psychology and Psychiatry, 25 (1), 133-139.

Boone, K. Ananth, J. Philpott, L. Kaur, A. and Djenderedjian, A. (1991). Neuropsychological characteristics of nondepressed adults with obsessive compulsive disorder. Neuropsychiatry, Neuropsychology, and Behavioural Neurology, 4, 96-109.

Bradley, L., and Bryant, P.E. (1985). Rhyme and reason in reading and spelling. Ann Arbour. University of Michigan Press.

Brett, P.M., Curtis, D., Robertson, M.M., and Gurling, H.M. (1995). Exclusion of the 5-HT1A serotonin neuroreceptor and tryptophan oxygenase genes in a large British kindred multiply affected with Tourette's syndrome, chronic motor tics, and obsessive-compulsive behaviour. American Journal of Psychiatry, 153 (5), 437-40.

Burgess, P.W. and Shallice, T. (1994b). Response Suppression, Initiation and Strategy use following frontal lobe lesions. Neuropsychologia (In Press)

Burgess, P.W. and Shallice, T. (1994a). Guessing, Rule Detection and frontal lobe lesions. Neuropsychologia (In Press).

Burns, G.L, Formea, G.M., Keortge, S., and Sternberger, L.G. (1995). The Utilization of Nonpatient Samples in the Study of Obsessive Compulsive Disorder. Behaviour Research and Therapy, 33 (2), 133-144.

Capstick, N. and Seldrup, J. (1977). Obsessional States: A study in the relationships between abnormalities occurring at the time of birth and the subsequent development of Obsessional Symptoms. Acta Psychiatrica Scandinavia, 56, 427-431

Carr, A.T. (1974). Compulsive neurosis: A review of the literature. Psychological Bulletin, 81, 311-318.

Chambless, D.L., Caputo, G.C., Bright, P., and Gallagher, R. (1984). Assessment of fear of fear in agoraphobicss: the body sensations questionnaire and the agoraphobic cognitions questionnaire. Journal of Consulting and Clinical Psychology, 52 (6), 1090-7.

Chen, E.Y.H., Shapleske, J., Luque, R., McKenna, P.J., Hodges, J.R., Calloway, S.P., Hymas, N.F.S., Dening, T.R. and Berrios, G.E. (1995). The Cambridge Neurological Inventory: A clinical instruent for soft neurological signs and the further neurological examination of psychiatric patients. Psychiatry Research, (in press)

Chevalier, G and Deniau, J.M. (1990). Disinhibition as a basic process in the expression of striatal functions. Trends in Neurosciences, 13 (7), 277-80.

Chiocca, E.A., and Maruza, R.L. (1990). Neurosurgical Therapy of Obsessive-compulsive disorder. . In Jenike, M.A., Baer, L and Minichiello, W.E. (Eds). OCD: Theory and Management. Second Edition Year Book Medical Publishers Ltd. Chapter 18

Christensen, K. Kim, S.W. Dyksen, M.W. and Hoover, K. M. Neuropsychological performance in obsessive compulsive disorder. Biological Psychiatry, 31, 4-18.

Clark, D. (1986). A cognitive approach to panic. Behaviour Research and Therapy, 24 (4), 461-470.

Clomipramine Collaborative Study Group (1991). Clomipramine in the treatment of patients with obsessive compulsive disorder. Archives of General Psychiatry, 48, 730-738

Cohen, L.J., Hollander, E., DeCaria, C.M., Stein, D.J., Simeon, D., Liebowitz, M.R., and Aronowitz, B, (1995). Specificity of Neuropsychological Impairment in Obsessive-Compulsive Disorder: A Comparison with Social Phobic and Normal Controls. Manuscript Submitted for Publication.

Comings, DE and Comings, B. (1987). Hereditary agoraphobia and obsesssive-compulsive behaviour in relatives of patients with Gilles de la Tourette Syndrome. British Journal of Psychiatry, 151, 1229-1241.

Cooper, J. (1970). The Leyton Obsessional Inventory. Psychological Medicine, 1, 48-64.

Cox, C.S. Fedio, P. and Rapoport, J. (1989). Neuropsychological testing of obsessive-compulsive adolescents. In J. Rapoport (ed.). Obsessive-Compulsive Disorder in Childhood and Adolescents. Washington, DC, American Psychiatric Association, 1989.

Dagonet, H. (1870). Des impulsions dans la folie et de la folie impulsive. Ann Med Psychol, 4, 5-32.

Davison, G.C. and Neale, J.M. (1994). Abnormal Psychology. Clinical Assessment Procedures. John Wiley and Sons Inc., Sixth Edition.

de la Tourette, G. (1885). Etude sur une affection nerveuse caraterisee par de l'incoordination motrice accompagnee d'echolalie et de coprolie. Archives of Neurology, 9, 19-42, 158-200.

de Silva, P. and Rachman, S. (1992). Obsessive Compulsive Disorder: The Facts. Oxford University Press.

Demaria, T., and Kassinove, H. (1988). Predicting guilt from irrational beliefs, religious affiliation, and religiosity. Journal of Rational-Emotive and Cognitive-Behaviour Therapy, 6, 259-272.

Denckla M. (1988) The neurologic examination of children with Obsessive compulsive disorder. In: Rapoport, J.L, (Ed). Childhood Obsessive Compulsive Disorder. Washington, DC, American Psychiatric Association, 1989.

Dent, H.R. and Salkovskis, P.M. (1986). Clinical measures of depression, anxiety and obsesionality in non-clinical populations. Behaviour Research and Therapy, 24, 689-691.

DeVeaugh-Geiss, J. (1994). Pharmacologic Therapy of obsessive-compulsive disorder. Advances in Pharmacology, 30, 35-52.

Diamond, B.M., Albrecht, W., and Borison, R.L. (1988). Neuropsychology of Obsessive Compulsive disorders (abstract 215), Society of the Biological Psychiatry Scientific Program, Montreal, Canada.

DiNardo, P., Barlow, D., Cerny, J., Vermilyea, B., Vermilyea, J., Himadi, W and Waddell, M. (1985). Anxiety Disorders Interview Schedule - Revised (ADIS-R). Albany, NY: Phobia and Anxiety Disorders Clinic, State University of New York at Albany.

Dowson, J.H. (1977) The phenomenology of severe obsessive-compulsive neurosis. Journal of British Psychiatry, 131, 75-78.

Dryden, W. (1994). Overcoming Guilt. Sheldon Press.

Edwards, S. and Dickerson, M. (1987a). Intrusive unwanted thoughts: A two-stage model of control. British Journal of Medical Psychology, 60, 317-328.

Edwards, S. and Dickerson, M. (1987b). On the similarity of positive and negative intrusions. Behaviour Research and Therapy, 25 (3), 207-211.

Eibl-Eibesfeld, I (1970). Ethology: the biology of behaviour. London, Holt, Rinehart and Winston.

Eisen, J.L., and Rasmussen, S.A. (1993). Obsessive Commpulsive Disorder with Psychotic Features. Journal of Clinical Psychiatry, 54, 373-379.

Ellis, A. (1962). Reason and Emotion in Psychotherapy. Lyle Stuart: New York.

Emmelkamp, P.M.G. and Beens, H. (1991). Cognitive therapy with obsessive-compulsive disorder: A comparative evaluation. Behaviour, Research, and Therapy, 29, 293-300.

Emmelkamp, P.M.G. Visser, S. and Hoekstra, R.J. (1988). Cognitive therapy vs. exposure in vivo in the treatment of obsessive-compulsives. Cognitive Therapy and Research, 12, 103-114.

England, S.L., and Dickerson, M. (1988). Intrusive thoughts: unpleasantness not the major cause of uncontrollability. Behaviour Research and Therapy, 26, 279-277.

Enright, S.J., and Beech, A.R. (1993). Reduced cognitive inhibition in Obsessive-compulsive disorder. British Journal of Clinical Psychology, 32, 67-74

Esquirol, J.E.D. (1838). Des Maladies Mentales Consider ees Sous le Rapports Medical, Hygienique et Medico-Legal (2 cols). Paris. Bailliere.

Eysenck, H.J., and Rachman, S. (1965). Causes and cures of neurosis. London. Routledge and Kegan Paul.

Eysenck HJ (1952) The scientific study of personality. Routledge and Kegan Paul, London

Fairburn, C.G., Jones, R., Peveler, R.C., Hope, R.A., and O'Connor, M.E. (1993). Psychotherapy and bulimia nervosa: the longer-term effects of interpersonal psychotherapy, behaviour therapy and cognitive behaviour therapy. Archives of General Psychiatry, 50, 419-428.

Fallon, B.A., Liebowitz, M.R., Hollander, E., Schneider, F.R., Campeas, R.B., Fairbanks, J., Papp., Hatterer, J.A., and Sandberg, D. (1990).The Pharmacotherapy of Moral or Religious Scrupulosity. Journal of Clinical Psychiatry, 51, 517-521

Fere, C. (1902). The Pathology of the Emotions. London, University Press.

Fitz, A. (1990. Religious and familial factors in the etiology of obsessive-compulsive disorder: A review. Journal of Psychology and Theology, 18, 141-147.

Flor-Henry, P. Yeudell, L.T. Koles, Z.J. and Howarth, B.G. (1979). Neuropsychological and power spectral EEG investigations of the obsessive-compulsive syndome. Biological Psychiatry, 14, 119-130.

Flor-Henry, P., and Lind, J. (1988). Further Neuropsychological studies of obsessive-compulsive syndrome (abstract 211), Society of the Biological Psychiatry Scientific Program, Montreal, Canada.

Fluoxetine Bulimia Nervosa Collaberative Study Group. (1992). Fluoxetine in the Treatment of Bulimia Nervosa: A multicentre, placebo-controlled, double-blind trial. Archives of General Psychiatry, 49 139-147.

Foa, E.B (1979). Failures in treating obsessive-compulsives. Behaviour Research and Therapy, 17, 169-176.

Foa, E.B., and Goldstein, A. (1978). Continuous exposure and strict response prevention in the treatment of obsessive-compulsive neurosis. Behaviour Therapy, 17, 169-176.

Forster, C.H. (1994). Polly's Magic Games: A Child's View of Obsessive-Compulsive Disorder. Dilligraf Publishing, Maine, USA.

Francis, L.J., and Stubbs, M.T. (1987). Measuring attitudes towards Christianity: From childhood into adulthood. Personality and Individual Differences, 8 (5), 741-743.

Frankel, M., Cummings, J.L., Robertson, M.M., Trimble, M.R., Hill, M.A, and Benson, D.F. (1986). Obsessions and Compulsions in Gilles de la Tourette Syndrome. Neurology, 36, 378-82.

Freeston, M.H., Ladoucer, R., Thibodeau, N. and Gagnon, F. (1992a). Cognitive Intrusions in a non-clinical Population I. Response Style, Subjective Experience and Appraisal. Behaviour Research and Therapy, 29 (6), 585-597.

Freeston,M.H., Ladouceur, R., Thibodeau, N., and Gagnon,F. (1992b). Cognitive intrusions in a non-clinical population. II. Associations with depresive, anxious and compulsive symptoms. Behaviour Research and Therapy, 30, 263-271.

Freeston, M.H., Ladouceur, R., Gagnon, F., and Thibodeau, N. (1993). Beliefs about Obsessional Thoughts. Journal of Psychopathology and Behavioural Assessment, 15 (1), 1-21

Freud, S. (1907). Obsessive Actions and Religious Practices. In the Standard Edition of the Complete Psychological Works of Sigmund Freud (1959). Vol IX, Hogarth, London, pp. 115-127.

Freud, S. (1926) Collected Papers. International Psychoanalytic Press.

Freud, S (1955). Notes upon a case of obsessional neurosis. In: Strachey J (ed) Standard Edition of the Complete Psychological Works of Sigmund Freud 10: 151-157. Hogarth Press, London.

Freud S 1966 The Disposition to Obsessional Neurosis. In: Strachey J (ed) Standard Edition of the Complete Psychological Works of Sigmund Freud 12: 311-326. Hogarth Press, London. Originally published in 1913

Frith, C.D. (1979). Consciousness, information processing and schizophrenia. British Journal of Psychiatry, 134, 225-235.

Frost, R.O. Steketee, G. Cohn, L. and Griess, K. (1994). Personality traits in subclinical and non-clinical obsessive-compulsive volunteers and their parents. Behavior, Research, and Therapy, 32, 47-56.

Garber, H.J., Ananth, J.V., Chiu, L.C. et al. (1989) Nuclear magnetic resonance study of obsessive-compulsive disorder. American Journal of Psychiatry, 146, 1001-1005.

George, M.S., Trimble, M.R., Ring, H.A., Sallee, F.R., and Robertson, M.M. (1993). Obsessions in Obsessive-compulsive disorder With and Without Gilles de la Tourette's Syndrome. American Journal of Psychiatry, 150 (1), 93-97

Glassman, W.E.(1993). The Biological Approach. Ch. 3 In: Medcof, J., and Roth, J. (Eds). Approaches to Psychology. Open University Press, 2nd Edition.

Gledhill, A. (1992). The Influence of a Responsibility Manipulation on decision making and its role in the aetiology of obsessional. . disorder. Master's thesis, University of Oxford.

Goldberger, E., and Rapoport, J.L. (1991). Canine acral lick dermatitis: response to the anti-obsessional drug clomipramine. Journal of American Animal Hospital Association, 27, 179-82.

Goldman-Rakic, P.S., and Selemon, L.D (1990). Basal Ganglia Research. Trends in Neurosciences, 13 (7), 241-4.

Goodman, W.K, and Price, L.H. (1990). Rating Scales for Obsessive-compulsive disorder. In Jenike, M.A., Baer, L., and Minichiello, W.E. (Eds), 2nd edition, Obsessive-compulsive disorders: Theory and Management. Year Book Medical Publishers, Inc.

Goodman, W.K. Price, L.H. Rassmussen, S.A. et al., (1989a). The Yale-Brown Obsesive Compulsive Scale (Y-Bocs): Part I. Development, use, and reliability. Archives of General Psychiatry, 46, 1006-1011.

Goodman, W.K., Price, L.H., Rasmussen, S.A., Delgad, P.L., Heninger, G.R., and Charney, D.S. (1989). Efficacy of fluvoxamine in obsessive-compulsive disorder: a double-blind comparison with placebo. Archives of General Psychiatry, 46, 36-44.

Goodman, W.K. , Price, L.H. Rassmussen, S.A. et al., (1989b). The Yale-Brown Obsesive Compulsive Scale (Y-Bocs): Part II. Validity. Archives of General Psychiatry, 46, 1012-1016.

Grand, I., and Reed, R. (1988). Neuropsychological Testing. Chapter 9 in Grune and Stratton (Eds), Neurology for Non-Neurologists.

Gray, J.A. (1971). The psychology of fear and stress. First Edition. London: Weidenfeld and Nicholson.

Gray, J.A. (1975). Elements of a two process theory of learning. London. Academic Press.

Gray, J.A. (1982). The Neuropsychology of Anxiety: An Enquiry into the functioning of the Septohippocampal System. New York. Oxford University Press.

Gray, J.A. (1985). A whole and its parts: Behaviour, the brain, cognition and emotion. Bulletin of the British Psychological Society, 38, 99-112.

Gray, J. (1995). A model of the limbic system and Basal Ganglia: applications to anxiety and Schizophrenia. In (Ed) Gazzaniga, M.S., The Cognitive Neurosciences. p. 1165-76. MIT Press: Cambridge, Ma.

Gray, J.A.(1970) The psychophysiological basis of introversion-extraversion. Behaviour Research and Therapy, 8, 249-266.

Graybiel, A.M. (1990). Neurotransmitters and Neuromodulators in the Basal Ganglia. Trends in Neurosciences, 13 (7), 244-54.

Grayson, J.B., Foa, E.B., and Steketee, G.S. (1986). Exposure in vivo of Obsessive-Compulsives under distracting and attention-focusing conditions: replication and extension. Behaviour Research and Therapy, 24, 475-479.

Greenberg, D. (1984). Are religious Compulsions religious or compulsive: a phenomenological study. American Journal of Psychotherapy, 38 (4), 524-532.

Greenberg, D. (1987). The behavioural treatment of religious compulsions. Journal of Psychology and Judaism, 11, 41-47.

Greenberg, D., and Witzum, E. (1991). Problems in the treatment of religious patients. American Journal of Psychotherapy, 45 (4), 554-565.

Grimshaw,L. (1964). Obsessional disorder and neurological illness. Journal of Neurol. Neurosurg. Psychiatry, 27, 229.

Hallam, R.S. (1985a). Anxiety and the brain: A reply to Gray. Bulletin of the British Psychological Society, 38, 217-219.

Hallam, R.S. (1985b). Anxiety: Psychological Perspectives on Panic and Agoraphobia. Academic Press. Harcourt Brace Jovanovich.

Harvey, N.S. (1987). Neurological factors in obsessive-compulsive disorder. British Journal of Pychiatry, 150, 567-568.

Haskovec, L. (1901). Contribution a la connaissance des idées obsédantes. XIII Congrès International de Medicine. Section Psychiatrie. Comptes Rendus, 121-131.

Head, D., Bolton, D., and Hymas, N. (1989) Deficit in Cognitive Shifting ability in Patients with Obsessive-Compulsive disorder. Biological Psychiatry, 25, 929-937.

Heinrichs, D.W., and Buchanan, R.W. (1988). Significance and meaning of neurological signs in schizophrenia. American Journal of Psychiatry, 145, 11-18.

Higgins, N.C., Pollard, C.A., and Merkel, W.T. (1992). Relationship between Religion-Related Factors and Obsessive Compulsive Disorder. Current Psychology: Research and Reviews, Winter Vol. 11 (1), 79-85.

Hirschorn, P. (1993). The Behaviourist Approach. In Approaches to Psychology, edited by Medcof, J., and Roth, J.. Methuen Publications, Open University Press, Buckinghamshire.

Hodgson, R., and Rachman, S. (1977). Obsessional Compulsive Complaints. Behaviour Research and Therapy, 15, 389-395.

Hodgson, R.J. and Rachman, S. (1972). The effects of contamination and washing in obsessional patients. Behaviour Research and Therapy, 10, 111-117

Hoffnung, R.A. Aizenberg, D.V. Hermesh, H. and Muntz, H. (1989). Religious compulsions and the spectrum concept of psychopathology. Psychopathology, 22, 141-144.

Holland, H.C. (1974). Displacement activity as a form of abnormal behaviour in animals. In Beech, H.R. (Ed): Obsessional States. London, Methuen, 161-173.

Hollander, E. (1993). Obsessive Compulsive Related Disorders. American Psychiatric Press, Washington, D.C.

Hollander, E., Cohen, L., Richards, M., Mullen, L., De Caria, C., Stern, Y. (1993). A pilot study of the neuropsychology of Obsessive-compulsive disorder and Parkinson's disease: Basal Ganglia Disorders. Clinical and Research Reports, 5 (1), 104-107

Hollander, E., Liebowitz, M.R., Rosen, W.G. (1991). Neuropsychiatric and Neuropsychological Studies in Obsessive-Compulsive Disorder. Chapter 6 in Zohar, J., Insel, T. and Rasmussen, S. (Eds). The Psychobiology of Obsessive-Compulsive Disorder. Springer-Verlag, New York, 126-145.

Hollander, E., Liebowitz, M.R., and DeCaria, C.M. (1989). Conceptual and Methodological Issues in Studies of Obsessive-compulsive and Tourette's Disorders. Psychiatric Developments, 4, 267-296

Hollander, E., Schiffman, E., Cohen, B., Rivera-Stein, M.A., Rosen, W., Gorman, J., Fyer, A.J., Papp, L and Liebowitz, M.R. (1990) Signs of Central Nervous System Dysfunction in Obsessive-compulsive Disorder. Archives of General Psychiatry, 47, 27-32.

Hollander, E., Zohar, J., Marazziti, D., and Olivier, B. (Eds.) (1994). Current Insights in Obsessive Compulsive Disorder. John Wiley & Sons Ltd., Chichester, England.

Holzer, J.C., Goodman, W.K., McDougle, C.J., Baer, L., Boyarsky, B.K., Leckman, J.F., and Price, L.H. (1994). Obsessive-Compulsive Disorder with and without a Chronic Tic Disorder: A comparison of symptoms in 70 Patients. British Journal of Psychiatry, 164, 469-473.

Hornsveld, R.H., Kraaimaat, F.W., and van Dam-Baggen, R.M.J. (1979). Anxiety/discomfort and handwashing in obsessive-compulsive and psychiatric control patients. Behaviour Research and Therapy, 17, 223-228

Hornsveld, R.H., Kraaimaat, F.W., and van Dam-Baggen, R.M.J. (1979). Anxiety/discomfort and handwashing in obsessive-compulsive and psychiatric control patients. Behaviour Research and Therapy, 17, 223-228

Hunter, R and MacAlpine, I. (1963) Three Hundred Years of Psychiatry, London, Oxford University Press.

Hymas, N., Lees, A., Bolton, D., et al (1991). The Neurology of Obsessional Slowness. Brain, 114, 2203-33.

Insel, T.R. (1988). Obsessive-Compulsive Disorder: A Neuroethological Perspective. Psychopharmacology Bulletin, 24 (3), 365-9.

Insel, T.R. (1992). Toward a neuroanatomy of Obsessive-compulsive Disorder. Archives of General Psychiatry,49, 739-744.

Insel, T.R., Donnelly, E.F., Lalakea, M.L., Alterman, I.S., Murphey, P.L. (1983). Neurological and nuropsychological studies of patients with obsessive-compulsive disorder. Biological Psychiatry, 18, 741-751

Insel, T.R., Mos, J., and Olivier, B. Animal models of obsessive-compulsive disorder: a review. Chapter 10 in (Eds). Hollander, E., Zohar, J., Marazziti, D., and Olivier, B. (Eds.) (1994). Current Insights in Obsessive Compulsive Disorder. John Wiley & Sons Ltd., Chichester, England.

Jakes, I. (1989). Salkovskis on Obsessional-compulsive neurosis: a critique. Behaviour Research and Therapy, 27 (6), 673-67

Jakes, I.C. (1993). The Cognitive-behavioural account of OCD. Unpublished Manuscript.

Jakes, I.C. (1994). Theoretical Approaches to Obsessive Compulsive Disorder, In Press.

Jakes, I. C. (1992) Some remarks on Mental Health. Unpublished Manuscript.

James, I.A., and Blackburn, I.M., (1995). Cognitive Therapy with Obsessive-Compulsive Disorder. British Journal of Psychiatry, 166, 444-450.

James, W. (1942). The varieties of Religous Experience, London. Longmans.

Janet, P (1889). L'automatisme psychologique. Paris, Alcan.

Janet, P (1903). Les Obsessions et la Psychiasthenie, Paris, Alcan, vol 1. (Reprinted in New York, Arno, 1976).

Jenike, M.A (1990). Drug treatment of Obsessive-compulsive disorder. In Jenike, M.A., Baer, L and Minichiello, W.E. (Eds). OCD: Theory and Management. Second Edition Year Book Medical Publishers Ltd. Chapter 17

Jenike, M.A (1990). Theories of Aetiology. In Jenike, M.A., Baer, L and Minichiello, W.E. (Eds). OCD: Theory and Management. Second Edition Year Book Medical Publishers Ltd. Chapter 8 p.101

Jenike, M.A., Baer, L., Summergrad, P., Ninichiello, W.E., Holland, A., and Seymour, R. (1990). Sertraline in obsessive-compulsive disorder: a double-blind comparison with placebo. American Journal of Psychiatry, 147 (7), 923-8.

Jenike, M.A., Hyman, S., Holland, A., Micichiello, W.E. Buttolph, L., Summergrad, P., Seymour, R., and Ricciardi, J. (1991). A controlled trial of fluvoxamine in obsessive-compulsive disorder: implications for a serotonergic theory. Comment in: American Journal of Psychiatry, 149 (3), 420-1.

Josephson, S.C., and Brondolo, E. (1993). Cognitive-Behavioural Approaches to Obsessive-Compulsive-Related Disorders. Chapter 11 In Hollander, E (Ed). Obsessive Compulsive Related Disorders. American Psychiatric Press, Washington, D.C.

Joughlin, N., Crisp, A.H., Halek,C., and Humphrey, H. (1992). Religious Belief and Anorexia Nervosa. International Journal of Eating Disorders, 12 (4), 397-406.

Kagan, J., Rosman, B.L., Day, D., Albert, J., and Phillips, W. (1964). Information processing in the child: Significance of analytic and reflective attitudes. Psychological Monographs, 78 (1).

Karno, M., Golding, J.M., Sorsenson, S.B. and Burnam, A. (1988). The Epidemiology of Obsessive-Compulsive Disorder in FIve US Communities. Archives of General Psychiatry, 45, 1094-1099.

Kaye, W.H., Weltzin, T.E., Hsu, L.K. G., Bulik, C.. (1991). An Open Trial of Fluoexetine in Patients with Anorexia Nervosa. Journal of Clinical Psychiatry, 52 (11), 464-71.

Kelly, D, Walter, C.J.S., Mitchell-Heggs, N., and Sargant, W. (1972). Modified leucotomy assessed clinically, physiologically and psychologically at six weeks and eighteen months. British Journal of Psychiatry, 120, 19-29

Kelly, D, Walter, C.J.S., and Sargant, W. (1966). Modified leucotomy assessed by forearm blood flow and other measurements. British Journal of Psychiatry, 112, 871-881

Kennard, M.A. (1960). Value of equivocal signs in neurologic diagnosis. Neurology, 10, 753-764.

Kettl, P.A., and Marks, I.M. (1986) Neurological Factors in Obsessive-compulsive Disorder: Two case reports and a review of the literature. British Journal of Psychiatry, 149, 315-319.

Kettl, P.A., and Marks, I.M. (1986) Neurological Factors in Obsessive-compulsive Disorder: Two case reports and a review of the literature. British Journal of Psychiatry, 149, 315-319.

Khanna S.(1991). Soft neurological signs in Obsessive Compulsive Disorder. Biological Psychiatry, 29, 442S (abstract only)..

King, D.J., Wilson, A., Cooper, S.G., and Waddington, J.L. (1991). The clinical correlates of neurological soft signs in chronic schizophrenia. British Journal of Psychiatry, 158, 770-775

Klass, E.T. (1987). Situational approach to the assessment of guilt: Development and validation of a self-report measure. Journal of psychopathology and Behavioural Assessment, 9, 35-48.

Koksal, F., and Power, K.G. (1990). Four Systems Anxiety Questionnaire (FSAQ): A Self-report measure of Somatic, Cognitive, Behavioural and Feeling Components. Journal of Personality Assessment, 54 (3 and 4), 534-544

Koksal, F., Power, K.G and Sharp, D.M. (1991). Profiles of DSM III Anxiety Disorders on the Somatic, Cognitive, Behavioural and Feeling Components of the Four Systems Anxiety Questionnaire.Personality and Individual Differences, 12 (6), 643-651.

Kolakowska, T., Williams, A.O., and Jambor, K. (1985). Schizophrenia with good and poor outcome. III. Neurological 'soft' signs, cognitive impairment and their clinical significance. British Journal of Psychiatry, 146, 348-357.

Kozak, M.J. and Foa, E.B. (1994). Obsessions, Overvalued Ideas and delusions in Obsessive-compulsive disorder. Behaviour Research and Therapy, 32 (3), 343-353.

Kozak, M.J., Foa, E.B., and Steketee, G. (1988). Process and outcome of exposure treatment with obsessive-compulsives. psychophysiological inidicators of emotional processing. Behaviour Therapy, 19, 157-169.

Kraeplin, E. (1883). Translated (1981). Clinical Psychiatry. A.R. Diefendorf, (Trans), Delmar, NY: Scholars' Facsimiles and Reprints.

Kramer, H., Sprenger, J. Malleus Maleficarum. Pushkin Press, London, 1951. [Qouted in Kaplan, H.I., Freedman, A.M., Sadock, B.J. Comprehensisve Textbook of Psychiatry/III, vol 2, Williams & Wilkins, Baltimore, 1980].

Kugler, K., and Jones, W. (1992). On Conceptualising and Assessing Guilt. Journal of Personality and Social Psychology, 62 (2), 318-327.

Lang, P. (1970). Stimulus control, response control, and the desensitization of fear. In Learning Approaches to Therapeutic Behaviour, edited by D.J. Levis. Chicago: Aldine Press.

Laplane, D., Levasseur, M., Pillon, B., Dubois, B., Baulac, M., Mazoyer, B., Trandinh, S., Sette, G., Danze, GF., and Baron, J.C. (1989). Obsessive-compulsive and other behavioural changes with bilateral basla ganglia lesions: a neuropsychological, magnetic resonance imaging and positron tomography study. Brain, 112, 699-725.

Latané, B., and Darley, J.M. (1970). The Unresponsive Bystander. Why doesn't he help? New York, Appleton.

Lazarus, R.S. (1964). A laboratory approach to the dynamics of psychological stress. American Psychologist, 19, 400-411.

Lazarus, R.S. (1966). Psychological Stress and the Coping Process. New York: McGraw-Hill.

Leckman, J.F. and Chittenden. (1990). Gilles de La Tourette's syndrome and some forms of Obsessive-compulsive disorder may share a common genetic diathesis. L'encephale, XVI, 321-3

Legrand du Saulle, H. (1875). La Folie du Doute (Avec Delire du Toucher). Paris, Delahaye.

Lewis, A. (1936). Problems of Obsessional Illness. Proceedings of the Royal Society of Medicine. Vol XXIX, 325-336.

Lewis, A. (1938). The Diagnosis and treatment of Obsessional States. The Practitioner, 141, 21-30.

Lewis, A. (1957). Obsessional Illness. RMPA Lecture, Acta Neurosiqu., Argentina, 3: 323

Lewis, A. (1965). A Note on Personality and Obsessional Illness. Psychit. Neurol. Basel. 150, 299-305.

Lewis, C.A. (1994). Religiosity and Obsessionality: The relationship between Freud's "Religious Practices" . The Journal of Psychology, 128 (2), 189-196.

Lewis, S.W., Chitkara, B., and Reveley, A.M. (1991). OCD and schizophrenia in three identical twin pairs. Psychological Medicine, 21, 135-141

Lezak, M. (1983). Neuropsychological Assessment. Oxford University Press: Oxford.

Lopatka, C. and Rachman, S. J. (1995). Perceived responsibility and compulsive checking: an experimental analysis. Behaviour Research and Therapy, In Press.

Lorenz, K. (1966). On aggression. New York: Bantam Books.

Lorenz, K. (1970). Studies in Animal and Human Behaiour. Translated by Martin R. Cambridge, MA., Harvard University Press.

Lorenz, K. (1971). Studies in Animal and Human Behaviour. Vol 2. Cambridge, Mass., Harvard University Press.

Luxenberg, J.S., Swedo, S.E., Flament, M.F., Friedland, R.P., Rapoport, J. and Rapoport, S.I. (1988). Neuroanatomical Abnormalities in Obsessive-Compulsive Disorder Detected with Quantitative X-Ray Computed Tomography. American Journal of Psychiatry, 145(9), 1089-1093.

Luys, J. (1881). Traite Clinique et Pratique des Maladies Mentales. Paris, Delahaye & Lecrosnier.

Lydiard, R.B. Obsessive-compulsive disorder: a new perspective in diagnosis and treatment. International Clinical Psychopharmacology, 9 (Suppl 3), 33-7.

MacDonald, A., Murray, R. and Clifford, C. (1992). The contribution of heredity to obsessional disorder and personality: A review of family and twin study evidence. In (Eds) Tsuang, M.T., Kendler, U.S., and Lyons, M.J. Genetic Issues in Psychosocial Epidemiology, Rutgers University Press.

MacDonald, A.(1995). The Structure of the Padua Inventory in a Normal British Population. Poster Presentation at World Congress of Cognitive and Behavioural Psychotherapies, Copenhagen, July 1995.

Machlin, S., Harris, G., Pearlson, G., Hoehn-Saric, R., Jefffrey, P., and Camargo, E. (1991) Elevated medial frontal cerebral blood flow in obsessive-compulsive patients: a SPECT study. American Journal of Psychiatry, 148, 1240-1242.

Magnan, V. (1890). Considerations generales sur la folie (des hereditaires ou degeneres). Prog Med 14. 1089-1090.

Malloy, P. (1987). Frontal lobe dysfunction in obsessive compulsive diorders. In E. Perecman (ed). The Frontal Lobes Revisited. IRBN Press.

Markowitz, P.J., Calabrese, J.R., Schulz, S.C., and Meltzer, H.Y. (1991). Fluoxetine in the Treatment of Borderline and Schizotypal Personality Disorders. American Journal of Psychiatry, 148, p. 1064-1067.

Marks, I.M., Hallam, R.S., Connolly, J., and Philpott, R. (1977). Nursing in behavioural psychotherapy. An advance of clinical role for nurses. Royal College of Nursing of the United Kingdom. London: White Friars Press.

Marshall, W.K. (1971). The treatment of Obsessional Illness and phobic anxiety states with Clomipramine. British Journal of Psychiatry, 119, 467-471

Martin, A., Pigott, T.A., Lalonde, F.M., Dalton, I., Dubbert, B., and Murphy, D.L. (1993). Lack of Evidence for Huntington's Disease-like Cognitive Dysfunction in Obsessive-Compulsive Disorder. Biological Psychiatry, 33, 345-353.

Martinot, J.L. Allilaire, J.F. Mazoyer, B.M. Hantouche, E., Huret, J.D., Legaut-Demare, F., Deslauriers, A.G., Hardy, P., Pappata, S., Baron, J.C., and Syrota, A., (1990). Obsessive-compulsive disorder: A clinical, neuropsychological and positron emission tomography study. Acta Psychiatrica Scandanavia, 82, 233-242.

Mas, F., Princhep, L., John, E. et al. (1991). Neurometric Q-EEG subtyping of obsessive-compuslive disorder. In: Maurer, K, ed. Imaging of the Brain in Psychiatry and Related Fields, Berlin, Germany: Springer-Verlag.

Maudsley, H. (1865). The pathology of the mind, revised edition. London: Macmillan.

Max, J.E., Smith, W.L. Jr, Lindgren, S.D., Robin, D.A., Mattheis, P., Steirwalt, J., Morrisey, M. (1995). Case study: obsessive-compulsive disorder after severe traumatic brain injury in an adolescent. Journal of the American Academy of Child and Adolescent Psychiatry, 34 (1), 45-9.

McDougle, C.J., Goodman, W.K., Price, L.H. et al. (1990). Neuroleptic addiction in fluvoxamine-refractory obsessive-compulsive disorder. American Journal of Psychiatry, 147, 652-654.

McElroy, S.L., Phillips, K.A., and Keck, P.E. Jr. (1994). Obsessive-compulsive spectrum disorder. Journal of Clinical Psychiatry, 55 (Suppl), 33-51; discussion 52-3.

McFall, M., and Wollersheim, J.P. (1979). Obsessive-compulsive neurosis: A Cognitive-Behavioural Formulation and Approach to treatment. Cognitive Therapy and Research, 3 (4), 333-348.

McGuire, P.K., Bench, C.J., Frith, C.D., Marks, I.M, Frackowiak, R.S.J. and Dolan, R.J. (1994). Functional Anatomy of Obsessive-compulsive phenomena. British Journal of Psychiatry, 164, 459-468.

McKeon, J., McGuffin, P., and Robinson, P. (1984). Obsessive-compulsive neurosis following Head Injury: A report of 4 cases. British Journal of Psychiatry, 144, 190-192.

McKeon, P., and Murray, R. (1987). Familial Aspects of Obsessive-compulsive Neurosis. British Journal of Psychiatry, 151, 528-534.

Meyer, V. (1966). Modification of expectations in cases with obsessional rituals. Behaviour Research and Therapy, 4, 273-80.

Micelli, M. (1992). How to make someone feel guilty: Strategies of guilt inducement and their goals. Journal for the theory of Social Behaviour, 22 (1), 81-104.

Mikkelson, E.J., Brown, G.L., Minichiello, M.D., Millican, F.K., and Rapoport, J.L. (1982). Neurologic status in hyperactive, enuretic, and normal boys. Journal of the American Academy of Child Psychiatry, 21, 75-81.

Miller, E. (1972). Clinical neuropsychology. Harmondsworth, Middlesex. Penguin.

Milner, B. (1963). Effects of different brain lesions on card sorting. Archives of Neurology, 9, 90-100.

Mindus, P., Rasmussen, S.A., and Lindquist, C. (1994). Neurosurgical treatment for refractory obsessive-compulsive disorder: implications for understanding frontal lobe function. Journal of Neuropsychiatry and Clinical Neuroscience, 6 (4), 467-77.

Minichiello, W.E., Baer, L., and Jenike, M.A. (1987). Schizotypal personality disorder: a poor prognostic indicator for behaviour therapy in the treatment of obsessive compulsive disorder. Journal of Anxiety Disorders, 1, 273-276.

Moddell, J.G., Mountz, J.M., Curtis, G.C., et al. (1989). Neurophysiological dysfunction in basal ganglia/limbic striatal and thalamocortical circuits as a pathogenic mechanism of obsessive-compulsive disorder. Journal of Neuropsychiatry, 1, 27-36.

Morel, B.A. (1866) Du delire emotif. Nevrose du systeme nerveaux ganglionaire visceral. Archives of Generale Medicine, 7, 385-402.

Mosher, L.R., Pollin, W., and Slabenaw, J.R. (1971). Identical twins discordant for schizophrenia. Archives of General Psychiatry, 24, 422-430.

Mowrer, O.H. (1939). A stimulus-response theory of anxiety. Psychological Review, 46, 553-65.

Mowrer, O.H. (1950). Learning Theory and Personality Dynamics. New York: Ronald Press.

Mowrer, O.H. (1960). Learning Theory and Behaviour. New York: Wiley.

Muris, P., Merckelbach, H., Van Den Hout, M., and De Jong, P. (1992). Suppression of emotional and neutral material. Behaviour Research and Therapy, 30 (6), 639-642.

Narramore, B. (1974). Guilt: Where theology and psychology meet. Journal of Psychology and Theology, 2, 18-25.

Nasrallah, H.H., Tippin, F. and McCalley-Whitters, M. (1983). Neurological soft signs in manic patients: a comparison with schizophrenic and control groups. Journal of affective disorders, 5, 45-50.

Nee, L.E., Caine, E.., Polinsky, R.J. et al (1980). Gilles de la Tourette syndrome: clinical and family study of 50 cases. Annals of Neurology, 7, 41-49.

Nelson, H.E., and O'Connell, A. (1975). Dementia: The estimation of pre-morbid intelligence levels using the new adult reading test. Cortex, 14, 234-244.

Niler, E.R. and Beck, S.J. (1989). The relationship among guilt, dysphoria, anxiety and obsessions in a normal population. Behavior, Research, and Therapy, 27, 213-220.

Nordahl TE, Benkelfat C, Semple W, et al. (1989) Cerebral glucose metabolic rates in obsessive compulsive disorder. Neuropsychopharmacology , 2, 23-28.

Norman, D.A. and Shallice, T. (1980). Attention to Action: Willed and Automatic Control of Behaviour. Center for Human Information Processing (Technical report No. 99). (Reprinted in revised form in: Consciousness and Self-regulation, Advances in Research and Theory, Vol 4 (1986). Edited by R.J. Davidson, G.E. Schwartz, and D. Shapiro. New York and London: Plenum Press, pp. 1-18).

Nunnally, J.C. (1978). Psychometric Theory (2nd Edition). New York. McGraw-Hill.

Nyby, J., and Thiessen, D.D. (1980). Food Hoarding in the Monglolian Gerbil (Meriones uniguiculatus): Effects of Food deprivation. Behavioural and Neural Biology, 30, 39-48.

Okasha, A., Saad, A., Khalil, A.H., Dawla, A.S., and Yehia, N. (1994). Phenomenology of Obsessive-Compulsive Disorder: A transcultural Study. Comprehensive Psychiatry, 35, 3, 191-197.

Otterbacher, J.R., and Munz, D.C. (1973).State-Trat measurement of experiential guilt. Journal of Consulting and Clinical Psychology, 40, 115-121.

Otto, M.W. (1990). Neuropsychological Approaches to Obsessive-Compulsive Disorder. Chapter 10 in Jenike, M.A., Baer, L., and Minichiello, W.E. (Eds). Obsessive-Compulsive Disorders: Theory and Management. Second Edition. Year Book Medical Publishers Inc., Mass.

Otto, M.W., Baer, L., and Jenike, M.A. (1992). Neuropsychological aspects of Obsessive-Compulsive Disorder: Frontal lobe and memory functions. Cited in Otto, M.W. (1992). Normal and Abnormal Information Processing: A Neuropsychological Perspective on Obsessive-Compulsive Disorder. The Psychiatric clinics of North America, 15, 825-849.

Paluzziui, P. (1962), Dictionary of Moral Theology, London. Burns and Oates

Papez, J.W. (1937). A proposed mechanism of emotion. Archives of Neurology and Psychiatry, 38, 725-743

Pato, M.T., Eisen, J.L. and Pato, C.N. (1994). Rating Scales for Obsessive-compulsive disorder. Ch.6 in Current Insights in Obsessive-compulsive Disorder edited by Hollander, E., Zohar, J., Marazziti, D., and Olivier, B. John Wiley & Sons Ltd, Chichester, England.

Paulhan, F. (1887). Les Phenomenes Affectifs (translated by C.K. Ogden as the Laws of Feeling), London, Kegan Paul.

Pauls, D. (1992). The genetics of obsessive compulsive disorder and Gilles de la Tourette's syndrome. The Psychiatric clinics of North America, 15, 759-766.

Pauls, D.L., Alsobrook, JP-2nd, Goodman, W., Rasmussen, S., and Leckman, J.F. (1995). A family study of obsessive-compulsive disorder. American Journal of Psychiatry, 152 (1), 76-84.

Pauls, D.L., Towbin, K.E., Leckman, J.F., Zahner, G.E.P., and Cohen, D.J. (1986). Gilles de la Tourette's syndrome and Obsessive-compulsive disorder. Archives of General Psychiatry, 43, 1180-82.

Paulsen and O'Donnell (1979). Construct validation of children's behaviour problem dimensions: relationship to activity level, impulsivity, and soft neurological signs. Journal of Psychology, 101, 273-278.

Pavlov, I.P. (1928). Lectures on conditioned reflexes. New York: International Publishers.

Peters, E.R., Pickering, A.D., and Hemsley, D.R. (1994). `Cognitive Inhibition' and positive symptomatology in schizotypy. British Journal of Clinical Psychology, 33 (1), 33-49.

Philpott, R. (1975). Recent advances in the behavioural assessment of obsessional illness: Difficulties common to these and other measures. Scottish Medical Journal, 20 (Suppl 1), 33-40

Piccinelli, M., Pini, S., Bellantuono, C., and Wilkinson, G. (1995). Efficacy of drugh treatment in Obsessive Compulsive Disorder: A meta-analytic review. British Journal of Psychiatry, 166, 424-443.

Pigott, T.A., Pato, M.T., Bernstein, S.E., Grover, G.N., Hill, J.L., Tolliver, T.J., and Murphey D.L. (1990). Controlled comparisons of CMI and fluoxetine in the treatment of obsessive-compulsive disorder. Archives of General Psychiatry, 47, 926-932.

Pitman, R. (1987). Pierre Janet on Obsessive-compulsive Disorder (1903): Review and Commentary. Archives of General Psychiatry, 44, 226-232.

Pitman, R.K., Green, R.C., Jenicke, M.A., and Mesullam, M.M. (1987). Clinical Comparison of Tourettes syndrome and Obsessive compulsive disorder American Journal of Psychiatry, 144, 1166-1171.

Pitres, A. and Regis, E. (1902). Les Obsesssions et les Impulsions. Paris, Octave Doin.

Price, L.H., Goodman, W.K., Charney, D.S., Rasmussen, S.A., and Heninger, G.R. (1987). Treatment of severe obsessive-compulsive diosre with fluvoxamine. American Journal of Psychiatry, 144, 1059-1061.

Prichep, L., Mas, F., John, E. et al. (1991). Neurometric subtyping of obsessive-compuslive disorders. In: Stefanis, C., Rabavilas, A., Soldatos, C. (eds). Psychiatry. A World Perspective, vol. 1. New York, N.Y: Elsevier Science, 557-562.

Quitkin, F, Rifkin, A., and Klein, D. F. (1976). Neurologic Soft signs in Schizophrenia and Character disorders. Archives of General Psychiatry, 33, 845-853

Rachman, S. (1971). Obsessional Ruminations. Behaviour Research and Therapy, 9, 229-235.

Rachman, S. (1974). Primary Obsessional Slowness. Behaviour Research and Therapy, 12, 9-18.

Rachman, S. (1976a). The Passing of the Two-Stage theory of fear and avoidance. Fresh Possibilities. Behaviour Research and Therapy, 14, 125-131.

Rachman, S. (1976b). Obsessive-compulsive Checking. Behaviour Research and Therapy, 14, 269-277.

Rachman, S.J., (1978). An Anatomy of Obsessions. Behavioural Analysis and Modification, 2 (4), 253-278.

Rachman, S. (1980). Emotional Processing. Behaviour Research and Therapy, 18, 51-60

Rachman, S.J. (1989). Fear and Courage. 2nd Edition. San Francisco. W.H. Freeman.

Rachman, S. (1993). Obsessions, responsibility, and guilt. Behaviour, Research, and Therapy, 149-154.

Rachman, S.J. and de Silva, P. (1978). Abnormal and normal Obsessions. Behaviour Research and Therapy, 16, 233-238.

Rachman, S. and Hodgson, R. (1980). Obsessions and Compulsions. Prentice-Hall: New Jersey.

Rachman, S.J., Shafran, R.L., and Thordarson, D. (1995). Thought-Action Fusion in Obsessive-Compulsive Disorder. Presentation at World Congress of Cognitive and Behavioural Psychotherapies, Copenhagen, July 1995. Submitted to Behaviour Research and Therapy.

Rachman, S.J., Thordarson, D., Shafran, R.L, and Woody, S. (1995). Perceived responsibility: structure and significance. Behaviour Research and Therapy, In Press

Rapoport, J. (1988). The Neurobiology of Obsessive-compulsive Disorder. Journal of the American Psychiatric Association, 260 (19), 2888-2890

Rapoport, J. (1989) (Ed). Obsessive-Compulsive Disorder in Children and Adolescents. American Psychiatric Press, Washington, USA.

Rapoport, J. (1990). Obsessive compulsive disorder and basal ganglia dysfunction. Psychological Medicine, 20 (3), 465-469.

Rapoport, J.L., and Wise, S.P. (1988). Obsessive-Compulsive Disorder: Evidence for a Basal Ganglia Dysfunction. Psychopharmacology Bulletin, 24 (3), 380-84.

Rapoport, J., Elkins, R., Langer, D. et al. (1981). Childhood Obsessive-compulsive disorder. American Journal of Psychiatry, 138, 1545-1554.

Rapoport, J., Ryland, D.H., and Kriete, M. (1992). Drug Treatment of Canine Acral Lick: an animal model of Obsessive-compulsive disorder. Archives of General Psychiatry, 49, 517-521.

Rasmussen, S.A. (1993). Genetic Studies of Obsessive Compulsive Disorder. Annals of Clinical Psychiatry, 5, 241-248.

Rasmussen, S.A. (1994). Genetic Studies of Obsessive-compulsive disorder. Ch 9 in Current Insights in Obsessive-compulsive Disorder edited by Hollander, E., Zohar, J., Marazziti, D., and Olivier, B. John Wiley and Sons Ltd, Chichester, England.

Rasmussen, S. and Eisen, J.L. (1991). Phenomenology of Obsessive-compulsive disorder: Clinical Subtypes, Heterogeneity and Coexistence. Chapter 2 In: (Eds) Zohar, J., Insel, T., and Rasmussen, S. (1991). The Psychobiology of Obsessive-compulsive disorder. Springer Series on Psychiatry, Volume 4, New York.

Rasmussen, S. and Eisen, J.L. (1992). The epidemiology and clinical features of obsessive compulsive disorder. The Psychiatric clinics of North America, 15, 743-758.

Rasmussen, S.A. and Eisen, J.L. (1990). Epidemiology of Obsessive-Compulsive Disorder. Journal of Clinical Psychiatry, 51 (2) [supplement] 10-13.

Reed, G.F. (1985). Obsessional experience and compulsive behaviour: a cognitive-structural Approach. Academic Press. London.

Reiss, S. (1987). Theoretical Perspectives on the fear of anxiety. Clinical Psychology Review, 7, 141-153.

Reynolds, M. & Salkovskis, P.M. (1991). The relationship among guilt, dysphoria, anxoeti and obsessions in a normal population: An attempted replication. Behaviour, Research, and Therapy, 29, 259-265.

Rhéaume, J., Ladouceur, R., Freeston, M.H., and Letarte, H. (1995). Inflated responsibility and its role in obsessive compulsive disorder: Validation of a theoretical definition of responsibility. Behaviour Research and Therapy, 33 (2), 159-171.

Ribot, T. (1904). Les Maladies de la valonte. Paris, Alcan.

Robertson, M., Trimble, M.R., and Lees, A.J. (1988). The psychopathology of the Gilles de la Tourette syndrome: a phenomenological analysis. British Journal of Psychiatry, 152, 383-90.

Robins, L., Helzer, J., Croughan, J., and Ratcliff, K. (1981). National Institute of Mental Health Diagnostic Interview Schedule: Its history, characteristics and validity. Archives of General Psychiatry, 38, 381-391.

Robinson, B.E., and Brodie, E.D. (1982). Food Hoarding Behaviour in the Short-tailed Shrew Blarina brevicauda. The American Midland Naturalist, 108 (2), 369-375.

Rogers, D. (1992). Motor Disorder in Psychiatry: Towards a neurological psychiatry. Chapter 5. Obsessive-compulsive Disorder, Hysteria and Mental Handicap. Wiley

Röper, G., and Rachman, S. (1976). Obsessional compulsive checking: Experimental replication and development. Behaviour Research and Therapy, 14, 23-32

Röper, G., Rachman, S., and Hodgson, R. (1973). An experiment on obsessional checking. Behaviour Research and Therapy, 11, 271-277

Rosen, M. (1975). A dual model of obesssional neurosis. Journal of Consulting and Clinical Psychology, 43, 452-59.

Rosen, W., Hollander, E., Stannick, V., and Liebowitz, M.R. (1988). Task performance variables in Obsessive-compulsive Disorder (abstract). Journal of Clinical and Experimental Neuropsychology, 10, 73.

Rubin, R.T., Villanueva-Meyer, J., Ananth, J., Trajmar, P.G., and Mena, I. (1992). Regional xenon 133 cerebral blood flow and cerbral technetium Tc 99m-HMPAO uptake in umedicated patients with obsessive-compulsive disorder and matched normal control subjects: determination by high resolution single-photon emission computed tomography. Archives of General Psychiatry, 49, 695-702.

Rudin,E. (1953). Ein Beitrag zur Frage der Zwangskrankheit. Archiv. für Psychiatrie Nervenkrankheiten, 191, 14-54.

Salkovksis, P.M., Rachman, S.J., Ladouceur, R., and Freeston, M. (1992). The definition of 'responsibility'. World Congress of Behavioural and Cognitive Psychotherapies, Toronto, Canada.

Salkovksis, P.M., Westbrook, D., Davis, J., Jeavons, A. and Gledhill, A. (1991). Effects of "Neutralising" on Intrusive Thoughts: An experiment on the aetiology of Obsessive-compulsive disorder. Unpublished Manuscript.

Salkovskis, P. (1985). Obsessional-compulsive Problems: A cognitive-behavioural analysis. Behaviour Research and Therapy, 23 (5). 571-583.

Salkovskis, P.M. (1989). Cognitive-Behavioural Factors and the Persistence of Intrusive thoughts in Obsessional Problems. Behaviour Research and Therapy, 27 (6), 677-682

Salkovskis, P.M. (1995). Cognitive-behavioural approaches to the understanding of Obsessional Problems. In Current Controversies in the Anxiety Disorders, In Rapee, R.M. (ed). New York, Guildford Press.

Salkovskis, P.M. and Campbell, P. (1994). Thought suppression induces intrusion in naturally occurring negative intrusive thoughts. Behaviour Research and Therapy, 32, 1-8.

Salkovskis, P.M. and Dent, H.R. (1989). Intrusive thoughts, impulses and imagery: cognitive and behavioural aspects. Unpublished manuscript.

Salkovskis, P.M., and Warwick, H.M.C. (1985). Cognitive therapy of obsessive-compulsive disorder: Treating treatment failures. Behavioural Psychotherapy, 13, 243-255.

Salkovskis, P.M., Gledhill, A., and Reynolds, M. (1995). The Responsibility Attitudes Scale. Manuscript In Preparation.

Salkovskis, P.M., Rachman, S.J., and Shafran, R.L. (1995). The biological theory of obsessive-compulsive disorder: a critique. Manuscript in Preparation.

Salkovskis, P.M., Wroe, A., Richards, C., Forster, E., and Sharpe, S. (1995). The Responsibility Interpretations Questionnaire. Manuscript in Preparation.

Salkovsksis, P.M. (1995b). Obsessive-compulsive disorder: Understanding is not improved by redefining it as something else. In Current Controversies in the Anxiety Disorders, Rapee, R.M. (ed). New York, Guildford Press

Salkovsksis, P.M. and Harrison (1984). Abnormal and Normal Obsessions: a replication. Behaviour Research and Therapy, 22, 549-552

Sanavio, E. (1988) Obsessions and Compulsions: The Padua Inventory. Behaviour Research and Therapy, 26 (2), p. 169-177.

Sandler, J., and Hazari, A. (1960). The obsessional: on the psychological classification of obsessional character traits and symptoms. British Journal of Medical Psychology, 33, 113-122.

Sawle, G.V., Hymas, N.F., Lees, A.J., and Frackowiak, R.S.J. (1991). Obsessional slowness: functional studies with positron emission tomography. Brain, 114, 2191-2202.

Schilder, P (1938). The organic background of obsessions and compulsions. American Journal of Psychiatry, 94, 1397.

Schoenfeld, I.S., Shaffer, D., and Barmack, J.E. (1989). Neurological Soft Signs and School Achievement: The mediating effects of sustained attention. Journal of Abnormal Child Psychology, 17 (6), 575-596.

Schroder, J., Niethammer, R., Geider, F., Reitz, C., Binkert, M., Jauss, M., and Sauer, H. (1992). Neurological soft signs in schizophrenia. Schizophrenia Research, 6, 25-30.

Shafer, S.Q., Shaffer, D., O'Connor, P.A., and Stokman, C.J. (1983). Hard thoughts on neurological 'soft signs'. In (Ed). Rutter,M., Developmental Neuropsychiatry. New York: Guildford Press, p144-163.

Shaffer, D., Schonfeld, I., O'Connor, P.A., Stokman, C., Trautman, P., Shafer, S., and Ng, S. (1985). Neurological soft signs and their relationship to psychiatric disorder: their relationship to psychiatric disorder and intelligence in childhood and adolescence. Archives of General Psychiatry, 42, 342-351

Shaffer, D., Stockman, C.J., O'Connor, P.A., et al. (1986). Early soft neurological signs and later psychopathology. In (Eds) Erlenmeyer-Kimling, N., Miller, N.E., and Hillsdale, N.J. Lifespan Research on the Prediction of Psychopathology. L. Erlbaum Associates, 31-48.

Shafran, R.L. (1995). The Manipulation of Responsibility. Presentation at World Congress of Cognitive and Behavioural Psychotherapies, Copenhagen, July 1995.

Shafran, R.L., and Tallis, F. (1995). Obsessive-compulsive hoarding: three cases suggesting the importance of learning and cognition. Submitted.

Shafran, R.L. and Thordarson, D. (1995). The Consistency of Behaviour. Expect the Unexpected. Journal of Psychosocial Nursing. In Press.

Shapiro, A.K., and Shapiro, E. (1992). Evaluation of the Reported Association of Obsessive-Compulsive Symptoms or Disorder with Tourette's Disorder. Comprehensive Psychiatry, 33 (3), 152-165

Shapiro, A.K., and Shapiro, E. (1992). Evaluation of the Reported Association of Obsessive-Compulsive Symptoms or Disorder with Tourette's Disorder. Comprehensive Psychiatry, 33 (3), 152-165

Shapiro, A.K., Shapiro, E., Bruun, RD and Sweet, RD (1978). Gilles de la Tourette Syndrome: New York: Raven Press,

Shaver, K. and Down, D. (1986). On Causality, Responsibility and Self-Blame: A Theoretical Note. Journal of Personality and Social Psychology, 50 (4), 697-702.

Sher, K. Frost, R. and Otto, R. (1983). Cognitive deficits in compulsive checkers: an exploratory study. Behaviour Research and Therapy, 21, 357-363.

Slater, E. and Roth, M. (1977) Eds. Clinical Psychiatry. London, Balliere Tindall.

Snowdon, J. (1980). A comparison of the Written and Postbox forms of the Leyton Obsessional Inventory. Psychological Medicine, 10, 165-170.

Societe Medico-Psychologique, Paris, Minutes (1866). Debate on folie raisonante, Ann Med Psychol 24: 382-426.

Societe Medico-Psychologique, Paris, Minutes (1875). Debate on folie avec conscience, Ann Med Psychol 33: 434-5.

Solomon, R., Kamin, L., and Wynne, L. (1953). Traumatic avoidance learning: The outcomes of several extinction procedures with dogs. Journal of Abnormal and Social Psychology, 48, 291-302.

Spielberger, C.D. Gorsuch R.L. Lushene, R. Vagg, P.R. and Jacobs, G.A. (1980). Manual for the State-Trait Anxiety Inventory. Consulting Psychology Press, Palo Alto.

Stanley, M.A., Turner, S.M., and Borden, J.W. (1990). Schizotypal features in Obsessive-compulsive disorder. Comprehensive Psychiatry., 31 (6), 519-34

Stein, D.J., and Hollander, E. (1993). The Spectrum of Obsessive-Compulsive-Related-Disorders. Chapter 12 In (Ed) Hollander, E. (1993). Obsessive Compulsive Related Disorders. American Psychiatric Press, Washington, D.C.

Stein, D.J., Hollander, E., and Cohen, L. (1994). Neuropsychiatry of Obsessive-compulsive Disorder. Chapter 13 in Hollander, E., Zohar, J., Marazziti, D., and Olivier, B. (Eds.) Current Insights in Obsessive-compulsive disorder. John Wiley and Sons, Inc. p.167-183.

Stein, D.J., Shoulberg, N., Helton, K., and Hollander, E. (1992). The Neuroethological Approach to Obsessive-Compulsive Disorder. Comprehensive Psychiatry, 33 (4), 274-281

Steketee, G, Quay, S. and White, K. (1991). Religion and guilt in OCD patients. Journal of anxiety disorders, 5, 359-367.

Sternbach, R.A., Janowsky, D.S., Huey, L.Y. et al. (1976). Effects of altering brain serotonin activity on human chronic pain. Advances in Pain Research and Therapy, 601-606.

Sternberger, L.G. and Burns, G.L. (1990). Compulsive Activity Checklist and the Maudsley Obsessional Compulsive Inventory:Psychometric Properties of two measures of Obsessive-compulsive disorder. Behaviour Therapy, 21, 117-127.

Suess, L and Halpern, M.S. (1990). Obsessive-Compulsive Disorder: The Religious Perspective. Chapter 18 in Rapoport, J.S. (Ed) Obsessions and Compulsions in Children and Adolescents

Swedo, S.E. (1990). Rituals and Releasers: An ethological Model of Obsessive-compulsive behaviour. Chapter 16 in Rapoport, J.S. (Ed) Obsessions and Compulsions in Children and Adolescents, American Psychiatric Press, Washington, D.C.

Swedo, S.E., Rapoport, J.L., Cheslow, D.L., Leonard, H., Ayoub, E.M., Hosier, D. and Wald, E.R. (1989a). High prevalence of Obsessive-Compulsive Symptoms in patients with Sydenham's Chorea. American Journal of Psychiatry, 146, 246-249

Swedo, S.E., Schapiro, M., Grady, C., Cheslow, D.L., Leonard, H., Kumar, A, Friedland, R., Rapoport, S and Rapoport, J. (1989b). Cerebral Glucose Metabolism in Childhood Onset OCD. Archives of General Psychiatry, 46, 518-523.

Tangney, J.P., Wagner, P., and Gramzow, R. (1992). Proneness to Shame, Proneness to Guilt and Psychopathology. Journal of Abnormal Psychology, 101 (3), p.469-478

Tallis, F. (1994) Obsessions, Responsibility, and Guilt: Two case reports suggesting a common and specific aetiology. Behaviour Research and Therapy, 32, 143-145

Tallis, F. (1995). Obsessive Compulsive Disorder: Cognition and Cognitive Neuropsychology. John Wiley & Sons Ltd, Chichester.

Tallis, F. and Shafran, R.L. (1995). Schizotypal Personality Characteristics in people with Obsessional Difficulties. Submitted.

Taylor, S. (1995). Assessment of Obsessions and Compulsions: Self-report Inventories and Observer-Rated Scales. Clinical Psychology Review, In Press.

Taylor, S., McNally, R.J., Koch, W.J., and Crockett, D.J. (1992). Conceptualisations of Anxiety Sensitivity. Psychological Assessment, 4 (2), 245-250.

Taylor, S., McNally, R.J., Koch, W.J., and Crockett, D.J. (1992). Conceptualisations of Anxiety Sensitivity. Psychological Assessment, 4 (2), 245-250.

Teasdale, J.D. (1983). Negative Thinking in depression: cause, effect or reciprocal relationship? Advances in Behaviour Research and Therapy, 5, 3-25.

Tinbergen, N. (1949). Social behaviour in animals. London. Methuen.

Tonkonogy, J., and Barreira, P. (1990) Obsessive-compulsive disorder and Caudate-Frontal Lesion. Vol 2 (3), 203-269. Raven Press Ltd, New York.

Turner, S.M., Beidel, D.C., and Nathan, R.S. (1985). Biological Factors in Obsessive-compulsive Disorders. Psychological Bulletin, 97, 3, 430-450.

Turner, S.M., Steketee, G.S., and Foa, E.B. (1978). Fear of Criticism in washers, checkers and phobics. Behaviour Research and Therapy, 17, 79-81.

Valleni-Basile, L.A., Garrison, C.Z., Jackson, K.L., Waller, J.L., McKewon, R.E., Addy, C.L., and Cuffe, S.P (1994). Frequency of Obsessive-compulsive disorder in a community sample of young adolescents. Journal of the American Academy of Child and Adolescent Psychiatry, 33 (6), 782-791.

van de Wetering, BMJ., Cohen, AP., and Minderaa, R.B et al. (1988) Het syndroom van Gilles de la Tourette,: Klinische Bevindingen. Nederlands Tijschrifte voor Geneeskinde, 132, 21-25

van Oppen, P. (1992). Obsessions and Compulsions: Dimensional Structure, Reliability, Convergent and Divergent Validity of the Padua Inventory. Behaviour Research and Therapy, 30 (6), 631-637.

van Oppen, P. (1994). Obsessive-compulsive disorder: Issues in treatment and assessment. Ph.D. Thesis, University of Amsterdam.

van Oppen, P. and Arntz, A. (1994). Cognitive therapy for obsessive compulsive disorder. Behaviour Research and Therapy, 32, 79-87.

van Oppen, P., de Haan, E., van Balkom, A.J.L.M., Spinhoven, P., Hoogduin, K., and van Dyck, R. (1995a). Cognitive Therapy and Exposure in Vivo in the treatment of Obsessive Compulsive Disorder. Behaviour Research and Therapy, In Press.

van Oppen, P., Emmelkamp, P.M.G., van Balkom, A.J.L.M., and van Dyck, R. (1995a). The sensitivity to change of measures for Obsessive-compulsive disorder. Journal of Anxiety Disorders, In Press.

van Oppen, P., Hoekstra, R.J., and Emmelkamp, P.M.G. (1995c). The Structure of Obsessive-compulsive symptoms. Behaviour Research and Therapy., 33 (1), 15-23.

Veale, D. (1993). The Classification and Treatment of Obsessional Slowness. British Journal of Psychiatry, 162, 198-203

Veale, D.M. Sahakian, B.J. Owen, A.M. and Marks, I.M. (1995). Cognitive deficits in tests sensitive to frontal lobe dysfunction in obsessive compulsive disorder. Submitted

Vitiello, B., Ricciuti, A.J., Stoff, D.M., Behar, D., and Denckla, M. (1989). Reliability of Subtle (Soft) Neurological Signs in Children. Journal of the American Academy of Child and Adolescent Psychiatry, 28 (5), 749-753.

Voith, K. (1985). The comparative long-term effects of ciladopa (AY-27,110), a chemically novel dopaminergic agonist, in 6-OHDA-lesioned and intact rats. Psychopharmacology, 85 (4), 405-409.

Von Economo, C. (1931). Encephalitis Lethargica: its sequellae and treatment. London, Oxford University Press [Translated from von Economo: Die enceptalitis lethargic deuticke, Vienna, 1917-1918. L'encephalik lethargica, Policlinica Rome, 1920].

Walker, E., and Green, M. (1982). Soft signs of neurological dysfunction in schizophrenia: an investigation of lateral performance. Biological Psychiatry, 17, 381-386.

Watkins, E., Charman, T, and Shafran, R.L. (1995). Guilt, depression, anxiety and obsessions in a normal population : a re-analysis. Poster Presentation at World Congress of Cognitive and Behavioural Psychotherapies, Copenhagen, July 1995.

Watkins, E., Shafran, R.L., and Charman, T. (1995). Guilt, Morality and Thought-Action Fusion in Obsessional Complaints. Paper in Preparation.

Watson, J.B. (1913). Psychology as the Behaviourist Views It. Psychological Review, 20, 158.

Wechsler, D. (1981). WAIS-R manual. New York: Psychological Corporation.

Wechsler, D. and Stone, C. (1945). Manual for the Wechsler Memory Scale. The Psychological Corp: New York.

Wegner, D.M. (1989). White bears and other unwanted thoughts: suppression, obsession and the psychology of mental control. New York: Viking.

Weilburg, J.B., Mesulam, M.M., Weintraub, S. et al. (1989). Focal striatal abnormalities in a patient with obsessive-compulsive disorder. Archives of Neurology, 46, 233-235

Weinberger, D.R. and Wyatt, R.J. (1982). Cerebral ventricular size: a biological marker for sub-typing schizophrenia. In: Usdin, E. Biological markers in psychiatry and neurology. Oxford: Pergamon Press, p505-512

Weissman, M.M., Bland, R.C., Canino, G.J., Greenwals, S., Hwu, H.G., Lee, C.K., Newman, S.C., Oakley-Browne, M.A., Rubio-Stipec, M., Wickramaratne, P.J., Wittchen, H.U., and Yeh, E.K. (1994). The Cross National Epidemiology of Obsessive Compulsive Disorder. : The Cross National Collaborative Group. Journal of Clinical Psychiatry, 55 (3: suppl), 5-10.

Westphal, K. (1877). Uber Zwangsvorstellungen. Arch Psychiatr Nervenkrankheiten, 8, 734-750.

Wing, J.K., Cooper, J.E., and Sartorius, N. (1974). The measurement and classification of psychiatric symptoms. London, Cambridge University Press.

Winslow, J.T., and Insel, T.R. (1991). Neuroethological Models of Obsessive-compulsive disorder. Ch. 10. In (Eds) Zohar, J., Insel, T., and Rasmussen, S. The Psychobiology of Obsessive-compulsive disorder. Springer Series on Psychiatry, Vol. 4, New York.

Wise, S. and Rapoport, J. (1989) Basal Ganglia Dysfunction. Chapter 19 In Rapoport, J. (Ed). Obsessive-Compulsive Disorder in Children and Adolescents. American Psychiatric Press, Washington.

Wolpe, J. (1958). Psychotherapy by Reciprocal Inhibition. Stanford, California. Stanford University Press.

Zielinski, C.M., Taylor, M.A., and Juzwin, K.R. (1991). Neuropsychological Deficits in Obsessive-Compulsive Disorder. Neuropsychiatry, Neuropsychology and Behavioural Neurology, 4 (2), 110-126.

Zohar, J. and Insel, T (1987). Obsessive-Compulsive Disorder: Psychobiological Approaches to Diagnosis, Treatment and Pathophysiology. Biological Psychiatry, 22, 667-687

Zohar, J., Insel, T., and Rasmussen, S.(1991) The Psychobiology of Obsessive-compulsive disorder. Springer Series on Psychiatry, Vol. 4, New York.

Zohar, J., Insel, T.R., Zohar-Kadouch, R.C., Hill, J.L., and Murphy, D.L. (1988). Serotonergic responsivity in obsessive-compulsive disorder: Effects of chronic clomipramine treatment. Archives of General Psychiatry, 45 (2), 167-72.

Appendix 1 An Investigation into the structure of Obsessional Symptoms

Aim

The primary aim of the current investigation was to determine the structure of Obsessional symptoms in a community obsessional sample in the United Kingdom, in order to identify possible sub-groups of patients with OCD with different symptom profiles.

The Padua Inventory

For this study, Obsessional symptoms were assessed using the Padua Inventory (Sanavio, 1988). This inventory is more comprehensive than the Maudsley Obsessional Compulsive Inventory (MOCI, Hodgson and Rachman, 1977) and is simpler to administer and more cost-effective than the Y-BOCS (Goodman et al. 1994). In addition, the study by Baer had already investigated the factor analysis of symptom subtypes of OCD and the factors identified were not compatible with studies documenting the phenomenology of the disorder.

The original Padua Inventory consists of 60 items "describing common obsessional and compulsive behaviour" (Sanavio, 1988, p.169). It "allows investigation of the topogrpahy of such problems in normal and clinical subjects" (p.169). The questionnaire was developed on a sample of 967 healthy Italians. Two compulsion factors, and two obsessional factors were identified (Sanavio, 1988). These factors were:-

1. *Impaired control of mental activities.* This factor represents a lower ability to remove undesirable thoughts, difficulties in coping with straightforward decisions and doubts, uncertainty and concern over responsibility for some negative events.
2. *Becoming contaminated.* This factor represents excessive hand-washing activities,

stereotyped cleaning behaviours and excessive concern with dirt.

3. *Checking behaviours.* This factor represents the repeated checking of a variety of different items including electrical items, letters and money.

4. *Urges and worries of losing control over motor behaviours.* This factor represents fear of obsessional impulses to harm oneself or others, or to commit other unacceptable acts.

These four factors accounted for 32.3% of the total variance (reported in van Oppen, 1992). Sternberger and Burns (1990) replicated this factor structure in healthy American students. The same factor solution was found in a healthy Dutch sample (van Oppen, 1992) and, most recently, in a healthy sample of British subjects (McDonald, 1994, personal communication or thesis?).

However, there has been little work on the nature of obsessional symptoms in an obsessional population, although during the course of the thesis, van Oppen has published a study investigating the both the criterion validity of the Padua Inventory and its factor structure in a Dutch sample of Obsessionals (van Oppen, 1995c). The Dutch study used 206 Obsessional subjects who had been referred to Dutch clinics for out-patient treatment of their disorder, and compared them with 430 non-clinical controls and 222 patients with other anxiety disorders. This study suggested a revision of the PI into a 41-item scale with 5 factors:-

1. Impulses (corresponding to original Factor 4).

2. Washing (corresponding to original Factor 2).

3. Checking (corresponding to original Factor 3)

4. Rumination (corresponding to original Factor 1).

5. Precision (items regarding rituals/order which had in normal samples been spread along the other 4 factors, in particular the `checking' factor).

This excellent study provided data on the reliability, discriminant validity and construct validity of the PI-R, although the data used to construct the revisions were also used to conduct the analyses to determine its reliability and validity. The study showed that the OCD group scored significantly more highly on the PI-R than the anxiety or healthy controls.

The Padua Inventory has not been administered to a British sample of people with obsessional difficulties, nor to obsessionals in the community. Examining the symptom profile of a community sample of obsessionals may improve future investigations of heterogeneity based on symptom sub-types.

Hypothesis and Prediction

Hypothesis: The structure of Obsessionals symptoms in a community obsessional sample in the United Kingdom will resemble that of the Dutch OCD Sample.

Prediction: 5 factors of impulses, washing, checking, rumination and precision will be identified.

METHOD

Subjects

Obsessional subjects were recruited from two sources. The first group (n=39) comprised subjects who had participated in the previous study. The all met DSM-II-R

criteria for OCD. A further 116 subjects responded to an advertisement for help with OCD, had a score of 11 or more on the MOCI, completed the questionnaire fully (ie no missing data) and 2/3 of these subjects reported receiving a diagnosis of OCD by another Clinician. Given that 2/49 subjects in the previous study who had been given the screening questionnaire and scored above 11 on the MOCI did not have OCD, it is likely that approximately 4% of the sample were included erroneously as having OCD. [1] However, as there were no significant differences on the MOCI scores between the 39 who had received a diagnosis according to DSM-III-R and the remaining 116 subjects (t= , p>0.05), the two groups were considered as one group labelled `Obsessionals'.

The normal sample was recruited by A. MacDonald (n=1958) who kindly allowed her data to be compared with that from the obsessional sample in order to fulfill the third aim of the study. The age of the normal sample ranged from 15-75 and 27%were male (511).

Subject Characteristics

All the subjects in the obsessional group had many obsessional symptoms (MOCI >=11) and 96% would have been expected to receive a diagnosis of OCD. 120 (84%) were female, 23 were male. The mean age of the sample was 36.49 years with a range from 16-70.

[1] Of the top 2% of scores of the normal population on the MOCI, 91% can be correctly classified as having OCD. (Burns et al, 1995).

Measures

Padua Inventory: (P I; Sanavio, 1988; van Oppen, 1995c). This is a 60-item list of common obsessional thoughts and compulsive behaviours (see Appendix 2). It has been revised to form a revised 41-item list (PI-Revised). Each of the items is rated on a five-point scale in terms of the frequency with which they are experienced. Data are reported which correspond to the original PI in order that comparisons can be made with published literature, and also correspond to the PI-R in order to compare the results with the recent Dutch study.

RESULTS

Descriptive Data

The data are presented in Tables 4 and 5.

Table 4: Comparison of PI scores (`score') and number of items rated `very much disturbing' (`obsessions') of Obsessional Scores in current study using Original P.I.

	Males			Females		
	N	Score	Obsessions	N	Score	Obsessions
Obsessionals (Present study)	23	95.2 (40.3)	11.04 (10.0)	120	96.6 (41.0)	13.2 (10.4)
Obsessive-Compulsives (from Sanavio, 1988)	35	83.6 (34.8)	7.5 (7.6)	40	98.6 (32.3)	11.3 (9.2)
`Neurotics' (Sanavio, 1988)	35	50.2 (28.9)	1.8 (2.9)	40	66.5 (32.4)	3.6 (4.6)
Normal controls (Sanavio, 1988)	489	53.6 (27.7)	Not reported	478	62.5 (29.2)	Not reported
Normal British Controls (MacDonald, 1994)	511	30.6 (24.6)	Not reported	1447	22.7 (23.5)	Not reported

There is no reason to conduct ANOVAs as Sanavio (1988) found significant differences between normals, neurotics and obsessionals.

An Independent T-test showed no significant difference between the total score or number of items rated `very much disturbing' for the Obsessionals and the published data from Sanavio (1988) for either males ($t=1.17$ and $t=1.53$ respectively; $p>0.05$) or females ($t=0.3$; $t=1.03$ respectively; $p>0.05$). The scores of the obsessional group were significantly higher

than the published scores for `neurotics' or for normal controls in the Italian or British studies (all $p>0.05$).

In summary, the data provided a replication of the findings from Sanavio (1988) using a British sample of community Obsessionals.

Table 5: Comparison of subscales of the PI-R and of the total scale (41-items) between Current study and Dutch Study (van Oppen, 1995c).

Scale	Impulses 7-items	Washing 10-items	Checking 7-items	Rumination 11-items	Precision 6-items	Total 41-items
Obsessionals (Current study). N=143	7.2 (6.6)	15.6 (12.6)	15.2 (7.9)	25.4 (10.5)	8.9 (6.9)	72.3 (29.0)
OCD (Van Oppen, 1995c). N=206	5.1 (5.7)	13.1 (11.1)	15.4 (7.7)	24.7 (9.2)	8.2 (6.1)	66.6 (24.3)
Panic Disorder (Van Oppen, 1995c). N=122	4.4 (4.6)	4.8 (6.3)	8.2 (6.2)	17.1 (8.5)	3.4 (3.7)	37.8 (21.5)
Normals (van Oppen, 1995c). N=430.	1.3 (2.1)	4.3 (4.8)	5.1 (4.8)	8.5 (6.4)	2.6 (3.2)	21.6 (15.9)

Group variances were not homogeneous and there is no reason to conduct a Mann-Whitney U-test as van Oppen (1995c) found a highly significant effect of diagnosis on the

subscales and total scale of the PI for almost all comparisons.

An Independent T-test showed significant differences in the total score between the current Obsessional sample and the normals or those with Panic Disorder (t=23.3 and t= 10.8, $p<0.01$ respectively). There was a trend for the current sample to score more highly on the total score than the published data for OCD patients from the Dutch study (t=1.98, p=0.05). There were no significant differences on the subscale scores for the current obsessional group and the published data of the Dutch OCD group ($p>0.05$) with the exception of the subscale of impulses which was significantly higher in the current sample ($t=3.18$; $p<0.01$).

In summary, the Obsessional group scored more highly than published data for normals or anxious controls. The study provided a good replication of the majority of findings from van Oppen (1995c)) using a British sample of community Obsessionals, with the exception of the total score for the PI-R and for the subscale of `impulses'.

Factor Analysis

A principal components analysis with iterations was used, followed by a varimax rotation in order to determine the structure of the Obsessional symptoms in the current sample. The analysis was conducted using the 41-items suggested by van Oppen (the PI-R) rather than the 60-item original PI in order that the current factor solution could be compared with the structure of obsessional symptoms in the Dutch study.

The 5 factor solution accounted for 59% of the variance. The factor structure is shown in Table 6. .

Table **The Factor Structure of the PI-R in a British sample of Obsessionals compared to a Dutch sample.**

	Factor 1: Contamination (van Oppen Factor 2)	Current	Dutch
4	I find it difficult to touch garbage or dirty things	.87	.78
9	If I touch something I think is contaminated, I immediately have to wash or clean myself	.85	.83
3	I find it difficult to touch an object when I know it has been touched by strangers or by certain people	.85	.83
7	I wash my hands more often and longer than necessary	.85	.78
8	I sometimes have to wash or clean myself simply because I think I may be dirty or `contaminated'	.84	.82
5	I avoid using public toilets because I am afraid of disease and contamination	.81	.74
1	I feel my hands are dirty when I touch money	.80	.74
10	If an animal touches me, I feel dirty and immediately have to wash or clean myself	.78	.75
6	I avoid using public telephones because of contagion and disease.	.78	.81
2	I think even slight contact with bodily secretions (perspiration, saliva, urine etc) may contaminate my clothes or somehow harm me.	.76	.62

	Factor 2: Rumination (van Oppen's Factor 4)	Current	Dutch
32	When I start thinking of certain things, I become obsessed with them	.81	.74
33	Unpleasant thoughts come into my mind against my will and I cannot get rid of them	.80	.68
31	I invent doubts and problems about most of the things I do	.73	.68
35	My brain constantly goes its own way and I find it difficult to attend to what is going on around me	.70	.72
44	When a thought or doubt comes into my mind I have to examine it from all points of view and cannot stop until I have done so	.61	.60
29	After doing something carefully I still have the impression I have either done it badly or not finished it	.60	.64
36	I imagine catastrophic consequences as a result of absent mindedness or minor errors which I make	.60	.64
45	In certain situations I am afraid of losing my self-control and doing embarrassing things	.48	<.40
26	I find it difficult to take decisions, even about unimportant matters	.48	.59
12	When I talk, I tend to repeat the same things and the sentences several times	.47	.55
28	I have the impression that I will never be able to explain things clearly, especially when talking about important matters that involve me	.45	.59
11	When doubts and worries come into my mind, I cannot rest until I have talked them over with a reassuring person	.37	.50

	Factor 3: Checking (van Oppen Factor 3)	Current	Dutch
20	I check and recheck the gas and water taps and light switches after turning them off	.81	.86
25	I check letters carefully many times before posting them	.80	.76
22	I keep on checking forms, documents, cheques etc. in detail to make sure I have filled them in correctly	.79	.76
21	I return home to check doors, windows, drawers etc to make sure they are properly shut	.78	.87
23	I keep on going back to see that matches, cigarettes etc are properly extinguished	.73	.76
19	I tend to keep on checking things more often than necessary	.70	.77
24	When I handle money, I count and recount it several times	.56	.56

	Factor 4: Impulses (van Oppen Factor 1)	Current	Dutch
47	When I see a train approaching, I sometimes think I could throw myself under its wheels	.84	.74
46	When I look down from a bridge or very high window, I feel an impulse to throw myself into space	.79	.68
50	Seeing weapons excites me and makes me think violent things	.73	.79
49	While driving I sometimes feel an impulse to drive the car into someone or something	.73	.60
53	I sometimes feel the need to break or damage things for no reason	.60	.66

	Factor 4: Impulses (van Oppen Factor 1) cntd..	Current	Dutch
51	I get upset and worried at the sight of knives, daggers and other pointed objects	.56	.70
45	In certain situations I am afraid of losing my self-control and doing embarrassing things	.46	.68

	Factor 5: Precision (van Oppen Factor 5)	Current	Dutch
15	Before going to sleep I have to do things in a certain order	.81	.66
14	I feel obliged to follow a particular order in dressing, undressing and washing myself	.75	.72
16	Before going to bed, I have to hang up or fold my clothes in a special way	.74	.48
17	I feel I have to repeat certain numbers for no reason	.66	.67
40	I sometimes start counting objects for no reason	.52	.61
41	I feel I have to remember completely unimportant numbers	.48	.55

The factor structure of the PI-R in a British community sample of Obsessionals is remarkably similar to that of the Dutch study. In both cases, a five-factor solution was preferred and all the items (except for item 45) loaded on the same factor in both samples.

The internal consistency (Cronbach's alpha) for the total score in the current OCD sample was 0.92 (excellent); Nunnally, 1978 from van Oppen, 1995c.

DISCUSSION

The prediction was fulfilled and the hypothesis supported. Five factors were identified in this population - impulses, contamination, checking, rumination and precision. It was unexpected that item 45 loaded on the `rumination' factor as well as the `impulses' factor. It

is possible that for some people, the fear of embarrassing oneself is associated with `becoming obsessed by things' and not being able to allay concerns whereas for others, the nature of the obsession is more akin to the fear of acting on obsessions.

In a normal population, four factors are found. This corresponds to the items in the factor `precision' or order being spread around the other four factors. However, if a factor analysis is conducted in which the number of factors are restricted to four, the resultant factor solution does not correspond to the four factors found in the normal population (with the items from the 'precision' factor being spread amongst the others). Rather, the `precision' factor is maintained but the `impulses' and `checking' factors merge together. These findings suggest that the qualitative nature of `ordering' is a distinguishing feature between the normal obsessions and compulsions experienced by the majority of the population (Rachman and de Silva, 1978; Harrison and Salkovskis, 1984) and those experienced by an obsessional population (MacDonald, 1994).

The structure of obsessional symptoms is important if future research on the heterogeneity of OCD is reliant on symptom-subtypes. The findings from data on the Padua Inventory indicate a very different symptom profile from that obtained on the Y-BOCS which identified three factors of 'hoarding/symmetry', 'contamination/cleaning' and 'pure obsessions'. Before investigations can take place to determine whether aetiological, management or treatment factors differ between groups of patients with different symptoms, it is important to identify homogeneous sub-groups with similar symptom profiles. Given the contradiction between sub-groups identified according to different measures, it may be some considerable time before consensus is reached as to the symptom profiles which characterise each sub-group.

SUMMARY

Analyses using the Padua-Inventory indicated 5 factors may be present - impulses, contamination, checking, rumination, and precision. It is possible that patients with different symptoms form unique homogeneous sub-groups, and that prognosis is different for these groups. However, at present, there is a debate as to the symptom profiles that may characterise these groups. Future work on the symptom heterogeneity of OCD should focus on reaching a consensus as to the sub-groups that comprise the disorder.

Appendix 2 - Questionnaires Used

CONSENT FORM

Background Information:- Obsessive-compulsive disorder (OCD) is a relatively common psychological disorder affecting up to 1 million people in the U.K. Obsessive-compulsive disorder can significantly interfere with daily functioning. Our research aims to find out more about this problem.

Procedure:- After you have completed these questionnaires, you will receive an analysis of your responses. This analysis may take approximately sex to twelve weeks to arrive. Please be patient, we have had an overwhelming response to our request for help. You will then receive a larger questionnaire package to complete and a thorough explanation of the research project. In addition, depending on where you live and your responses to the questionnaires, you may be invited to participate in the second stage of the study. You will receive details about the next stage which involves personal assessments. Please indicate below if you would be willing to travel to the Institute of Psychiatry, if requested. All travelling expenses can be reimbursed.

You are under no obligation to complete these questionnaires. If you do not wish to complete your questionnaires, please return them blank in the envelope provided. This will not affect any treatment that you may receive now or in the future.

Potential risks:- There are no risks to your health associated with participating in this study. The larger questionnaire package may take between 1 and 3 hours to complete.

Potential benefits:- If you do wish to complete the questionnaires, you will be helping us to better understand OCD. Hopefully this will eventually lead to an improvement in the treatment available to sufferers. You will receive an analysis of your individual responses and be given an opportunity to obtain information about OCD from experts in the area. In addition, you may be invited to participate in the second stage of the study in which you will receive a detailed psychological assessment.

Please sign below to acknowledge understanding of the explanation of the study, entering into the study, and receiving a copy of the consent form.

Name:_____

Signature:_____ Date:_____

Are you willing to receive a larger questionnaire package?

YES/NO (please circle as applicable)

Are you willing to travel to the Institute of Psychiatry for a personal assessment?

YES/NO (please circle as applicable).

PLEASE RETURN THIS FORM AND THE QUESTIONNAIRES IN THE ENVELOPE PROVIDED. THANK YOU.

The Maudsley Obsessional Compulsive Inventory (MOCI; Hodgson and Rachman, 1977).

Please answer each question by putting a circle around the "TRUE" or the "FALSE" following the question. There are no right or wrong answers, and no trick questions. Work quickly and do not think too long about the exact meaning of the questions.

1.	I avoid using public telephones because of possible contamination.	TRUE	FALSE
2.	I frequently get nasty thoughts and have difficulty in getting rid of them.	TRUE	FALSE
3.	I am more concerned than most people about honesty.	TRUE	FALSE
4.	I am often late because I can't seem to get through everything on time.	TRUE	FALSE
5.	I don't worry unduly about contamination if I touch an animal.	TRUE	FALSE
6.	I frequently have to check things (e.g. gas or water taps, doors, etc.) several times.	TRUE	FALSE
7.	I have a very strict conscience.	TRUE	FALSE
8.	I find that almost every day I am upset by unpleasant thoughts that come into my mind against my will.	TRUE	FALSE
9.	I do not worry unduly if I accidently bump into somebody.	TRUE	FALSE
10.	I usually have serious doubts about the simple everyday things I do.	TRUE	FALSE
11.	Neither of my parents was very strict during my childhood.	TRUE	FALSE
12.	I tend to get behind in my work because I repeat things over and over again.	TRUE	FALSE
13.	I use only an average amount of soap.	TRUE	FALSE
14.	Some numbers are extremely unlucky.	TRUE	FALSE
15.	I do not check letters over and over again before posting them.	TRUE	FALSE
16.	I do not take a long time to dress in a morning.	TRUE	FALSE
17.	I am not excessively concerned about cleanliness.	TRUE	FALSE
18.	One of my major problems is that I pay too much attention to detail.	TRUE	FALSE
19.	I can use well-kept toilets without any hesitation.	TRUE	FALSE
20.	My major problem is repeated checking.	TRUE	FALSE
21.	I am not unduly concerned about germs and diseases.	TRUE	FALSE
22.	I do not tend to check things more than once.	TRUE	FALSE
23.	I do not stick to a very strict routine when doing ordinary things.	TRUE	FALSE
24.	My hands do not feel dirty after touching money.	TRUE	FALSE
25.	I do not usually count when doing a routine task.	TRUE	FALSE
26.	I take rather a long time to complete my washing in the morning.	TRUE	FALSE
27.	I do not use a great deal of antiseptics.	TRUE	FALSE
28.	I spend a lot of time every day checking things over and over again.	TRUE	FALSE
29.	Hanging and folding my clothes at night does not take up a lot of time.	TRUE	FALSE
30.	Even when I do something very carefully I often feel that it is not quite right.	TRUE	FALSE

Please write your **AGE:** and **SEX:**

The Padua Inventory

Instructions: *The following statements refer to thoughts and behaviours which may occur to everyone in everyday life. For each statement, choose the reply which best seems to fit you and the degree of disturbance which such thoughts or behaviours may create. Rate your replies as follows:*

0 – not at all
1 – a little
2 – quite a lot
3 – a lot
4 – very much

Name ..... Date .....

	0	1	2	3	4
1. I feel my hands are dirty when I touch money	☐	☐	☐	☐	☐
2. I think even slight contact with bodily secretions (perspirations, saliva, urine etc.) may contaminate my clothes or somehow harm me	☐	☐	☐	☐	☐
3. I find it difficult to touch an object when I know it has been touched by strangers or by certain people	☐	☐	☐	☐	☐
4. I find it difficult to touch rubbish or dirty things	☐	☐	☐	☐	☐
5. I avoid using public toilets because I am afraid of disease and contamination ..	☐	☐	☐	☐	☐
6. I avoid using public telephones because I am afraid of contagion and disease ..	☐	☐	☐	☐	☐
7. I wash my hands more often and longer than necessary	☐	☐	☐	☐	☐
8. I sometimes have to wash or clean myself simply because I think I may be dirty or 'contaminated'	☐	☐	☐	☐	☐
9. If I touch something I think is 'contaminated' I immediately have to wash or clean myself	☐	☐	☐	☐	☐
10. If an animal touches me, I feel dirty and immediately have to wash myself or change my clothing	☐	☐	☐	☐	☐
11. When doubts and worries come to my mind, I cannot rest until I have talked them over with a reassuring person	☐	☐	☐	☐	☐
12. When I talk I tend to repeat the same things and the same sentences several times	☐	☐	☐	☐	☐

	0	1	2	3	4
13. I tend to ask people to repeat the same things to me several times consecutively, even though I did understand what they said the first time	☐	☐	☐	☐	☐
14. I feel obliged to follow a particular order in dressing, undressing and washing myself	☐	☐	☐	☐	☐
15. Before going to sleep I have to do certain things in a certain order	☐	☐	☐	☐	☐
16. Before going to bed I have to hang up or fold my clothes in a special way	☐	☐	☐	☐	☐
17. I feel I have to repeat certain numbers for no reason	☐	☐	☐	☐	☐
18. I have to do things several times before I think they are properly done	☐	☐	☐	☐	☐
19. I tend to keep on checking things more often than necessary	☐	☐	☐	☐	☐
20. I check and recheck gas and water taps and light switches after turning them off	☐	☐	☐	☐	☐
21. I return home to check doors, windows, drawers etc., to make sure they are properly shut	☐	☐	☐	☐	☐
22. I keep on checking forms, documents, cheques etc. in detail, to make sure I have filled them in correctly	☐	☐	☐	☐	☐
23. I keep on going back to see that matches, cigarettes etc. are properly extinguished	☐	☐	☐	☐	☐
24. When I handle money I count and recount it several times	☐	☐	☐	☐	☐
25. I check letters carefully many times before posting them	☐	☐	☐	☐	☐
26. I find it difficult to take decisions, even about unimportant matters	☐	☐	☐	☐	☐
27. Sometimes I am not sure I have done things which in fact I know I have done	☐	☐	☐	☐	☐
28. I have the impression that I will never be able to explain things clearly, especially when talking about important matters that involve me	☐	☐	☐	☐	☐
29. After doing something carefully, I still have the impression I have either done it badly or not finished it	☐	☐	☐	☐	☐
30. I am sometimes late because I keep on doing certain things more often than necessary	☐	☐	☐	☐	☐
31. I invent doubts and problems about most of the things I do	☐	☐	☐	☐	☐
32. When I start thinking of certain things, I become obsessed with them	☐	☐	☐	☐	☐
33. Unpleasant thoughts come into my mind against my will and I cannot get rid of them	☐	☐	☐	☐	☐

THE PADUA INVENTORY

	0	1	2	3	4
34. Obscene or dirty words come into my mind and I cannot get rid of them	☐	☐	☐	☐	☐
35. My brain constantly goes its own way and I find it difficult to attend to what is happening round me	☐	☐	☐	☐	☐
36. I imagine catastrophic consequences as a result of absent-mindedness or minor errors which I make	☐	☐	☐	☐	☐
37. I think or worry at length about having hurt someone without knowing it	☐	☐	☐	☐	☐
38. When I hear about a disaster, I think it is somehow my fault	☐	☐	☐	☐	☐
39. I sometimes worry at length for no reason that I have hurt myself or have some disease	☐	☐	☐	☐	☐
40. I sometimes start counting objects for no reason	☐	☐	☐	☐	☐
41. I feel I have to remember completely unimportant numbers	☐	☐	☐	☐	☐
42. When I read I have the impression I have missed something important and must go back and reread the passage at least two or three times	☐	☐	☐	☐	☐
43. I worry about remembering completely unimportant things and make an effort not to forget them	☐	☐	☐	☐	☐
44. When a thought or doubt comes into my mind, I have to examine it from all points of view and cannot stop until I have done so	☐	☐	☐	☐	☐
45. In certain situations I am afraid of losing my self-control and doing embarrassing things	☐	☐	☐	☐	☐
46. When I look down from a bridge or a very high window, I feel an impulse to throw myself into space	☐	☐	☐	☐	☐
47. When I see a train approaching I sometimes think I could throw myself under its wheels	☐	☐	☐	☐	☐
48. At certain moments I am tempted to tear off my clothes in public	☐	☐	☐	☐	☐
49. While driving I sometimes feel an impulse to drive the car into someone or something	☐	☐	☐	☐	☐
50. Seeing weapons excites me and makes me think violent thoughts	☐	☐	☐	☐	☐
51. I get upset and worried at the sight of knives, daggers and other pointed objects	☐	☐	☐	☐	☐
52. I sometimes feel something inside me which makes me do things which are really senseless and which I do not want to do	☐	☐	☐	☐	☐
53. I sometimes feel the need to break or damage things for no reason	☐	☐	☐	☐	☐

THE PADUA INVENTORY

	0	1	2	3	4
54. I sometimes have an impulse to steal other people's belongings, even if they are of no use to me	☐	☐	☐	☐	☐
55. I am sometimes almost irresistibly tempted to steal something from the supermarket	☐	☐	☐	☐	☐
56. I sometimes have an impulse to hurt defenceless children or animals	☐	☐	☐	☐	☐
57. I feel I have to make special gestures or walk in a certain way	☐	☐	☐	☐	☐
58. In certain situations I feel an impulse to eat too much, even if I am then ill	☐	☐	☐	☐	☐
59. When I hear about a suicide or a crime, I am upset for a long time and find it difficult to stop thinking about it	☐	☐	☐	☐	☐
60. I invent useless worries about germs and diseases	☐	☐	☐	☐	☐

The Checking Questionnaire (Based on Sher et al., 1993)

Checking Questionnaire

		Not at All	Infrequently	Sometimes	Often	Very Often
1.	I repeatedly check to make sure I have my wallet or purse	0	1	2	3	4
2.	I repeatedly check to make sure that I have my keys	0	1	2	3	4
3.	I repeatedly check to make sure that my car or house door is locked	0	1	2	3	4
4.	I repeatedly check my clothing (e.g., to see if my zipper or buttons are undone)	0	1	2	3	4
5.	I repeatedly check gas or electrical appliances to make sure that they are turned off	0	1	2	3	4
6.	I repeatedly check water faucets to make sure that they are turned off	0	1	2	3	4
7.	I repeatedly check my alarm clock before going to bed to make sure it is set properly	0	1	2	3	4
8.	I repeatedly check the address on a letter and its envelope to make sure that it is the same	0	1	2	3	4
9.	Whenever I work with numbers, I repeatedly check my calculations	0	1	2	3	4
10.	I repeatedly check in my mirror to see if I have accidentally knocked someone over while driving	0	1	2	3	4
11.	Before buying food, I repeatedly check over it	0	1	2	3	4
12.	When reading I repeatedly go back over what I have already read	0	1	2	3	4
13.	I repeatedly check that I have put sharp instruments such as knives away safely	0	1	2	3	4
14.	I telephone my family repeatedly to check that they are all right	0	1	2	3	4
15.	I repeatedly check my work	0	1	2	3	4
16.	I repeatedly check before I put a letter in the mailbox	0	1	2	3	4
17.	I repeatedly check to make sure I have not left any belongings behind	0	1	2	3	4
18.	When walking outside, I repeatedly check the ground for dirt	0	1	2	3	4
19.	I repeatedly check to make sure I look okay	0	1	2	3	4
20.	I repeatedly check the floor to make sure there is no splintered glass	0	1	2	3	4
21.	I repeatedly check appliances/light switches to make sure they are off	0	1	2	3	4
22.	I repeatedly check my thoughts to make sure that they are acceptable	0	1	2	3	4
23.	I repeatedly check my body for symptoms of illness	0	1	2	3	4

IBRO 1.4

The Inventory of Beliefs Related to Obsessions (IBRO; Freeston et al., 1993)

Belief Inventory

The statements below describe the attitudes people may have towards their own thoughts. Please mark the space next to each statement according to how strongly you believe that it is true or false for you. Please mark every one.

6: I believe strongly that this statement is true,
5: I believe that this statement is true,
4: I believe that this statement is probably true, at least more true than false,
3: I believe that this statement is probably false, at least more false than true,
2: I believe that this statement is false,
1: I believe strongly that this statement is false.

___ 1. Thoughts are in themselves harmless.
___ 2. Uncertainty should not disturb.
___ 3. It is unforgivable to be responsible for an error that makes oneself look bad
___ 4. Guilt is an appropriate response to unacceptable thoughts.
___ 5. Danger is always a terrible.thing.
___ 6. If one believes that there is even the slightest possibility of having caused harm, then one must act so as not to be blamed.
___ 7. One should avoid at any price any activity that runs the possibility of being held personally responsible for a loss.
___ 8. Loss is always a terrible thing.
___ 9. One should feel guilty if thoughts are not controlled.
___ 10. Not being able to control thoughts will harm no one.
___ 11. Enduring unpleasant thoughts without doing anything is dangerous for the person who has them.
___ 12. Generally speaking it is preferable to carry responsibility alone.
___ 13. Punishing oneself for errors that may have been made will enable future errors to be avoided.
___ 14. Enduring unpleasant thoughts without doing anything can lead to their disappearance.
___ 15. A responsible person does not let unpleasant thoughts happen without trying to control them.
___ 16. The loss of someone dear is always unbearable.
___ 17. One is to blame if something happens that one has thought about.
___ 18. To be uncertain about having caused possible harm is unbearable even if the possibility is very unlikely.
___ 19. Uncertainty is a source for concern.
___ 20. One should feel very guilty if there is the slightest possibility that one is responsible for an unfortunate event.

On this questionnaire are groups of statements. Please read each group of statements carefully. Then pick out the one statement in each group that best describes the way you have been feeling during the *PAST WEEK, INCLUDING TODAY*. Circle the number beside the statement you picked. If several statements in the group seem to apply equally well, circle each one. Be sure to read all the statements in each group before making your choice.

1. 0 I do not feel sad
   1 I feel sad
   2 I am sad all the time and I can't snap out of it
   3 I am so sad or unhappy that I can't stand it

2. 0 I am not particularly discouraged about the future
   1 I feel discouraged about the future
   2 I feel I have nothing to look forward to
   3 I feel that the future is hopeless and that things cannot improve

3. 0 I do not feel like a failure
   1 I feel that I have failed more than the average person
   2 As I look back on my life, all I can see is a lot of failures
   3 I feel I am a complete failure as a person

4. 0 I get as much satisfaction out of things as I used to
   1 I don't enjoy things the way I used to
   2 I don't get real satisfaction out of anything anymore
   3 I am dissatisfied or bored with everything

5. 0 I don't feel particularly guilty
   1 I feel guilty a good part of the time
   2 I feel quite guilty most of the time
   3 I feel guilty all of the time

6. 0 I don't feel I am being punished
   1 I feel I may be punished
   2 I expect to be punished
   3 I feel I am being punished

7. 0 I don't feel disappointed in myself
   1 I am disappointed in myself
   2 I am disgusted in myself
   3 I hate myself

8. 0 I don't feel I am any worse than anybody else
   1 I am critical of myself for my weaknesses or mistakes
   2 I blame myself all the time for my faults
   3 I blame myself for everything bad that happens

9. 0 I don't have any thoughts of killing myself
   1 I have thoughts of killing myself, but I would not carry them out
   2 I would like to kill myself
   3 I would kill myself if I had the chance

10. 0 I don't cry any more than usual
    1 I cry more than I used to
    2 I cry all the time now
    3 I used to be able to cry, but now I can't cry even though I want to

11. 0 I am no more irritated now than I ever am
    1 I get annoyed or irritated more easily than I used to
    2 I feel irritated all the time now
    3 I don't get irritated at all by the things that used to irritate me

12. 0 I have not lost interest in other people
    1 I am less interested in other people than I used to be
    2 I have lost most of my interest in other people
    3 I have lost all my interest in other people

13. 0 I make decisions about as well as I ever could
    1 I put off making decisions more than I used to
    2 I have greater difficulty in making decisions than before
    3 I can't make decisions at all any more

14. 0 I don't feel I look any worse than I used to
    1 I am worried that I am looking old or unattractive
    2 I feel that there are permanent changes in my appearance that make me look unattractive
    3 I believe I look ugly

15. 0 I can work about as well as before
    1 It takes an extra effort to get started at doing something
    2 I have to push myself very hard to do anything
    3 I can't do any work at all

16. 0 I can sleep as well as usual
    1 I don't sleep as well as I used to
    2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep
    3 I wake up several hours earlier than I used to and cannot get back to sleep

17. 0 I don't get more tired than usual
    1 I get tired more easily than I used to
    2 I get tired from doing almost anything
    3 I am too tired to do anything

18. 0 My appetite is no worse than usual
    1 My appetite is not as good as it used to be
    2 My appetite is much worse now
    3 I have no appetite at all anymore

19. 0 I haven't lost much weight, if any, lately
    1 I have lost more than 5 pounds
    2 I have lost more than 10 pounds
    3 I have lost more than 15 pounds

19b. I am purposely trying to lose weight by

eating less: YES _____ NO _____

20. 0 I am no more worried about my health than usual
    1 I am worried about physical problems such as aches and pains, or upset stomach, or constipation
    2 I am very worried about physical problems and it's hard to think of much else
    3 I am so worried about my physical problems that I cannot think about anything else

21. 0 I have not noticed any recent change in my interest in sex
    1 I am less interested in sex than I used to be
    2 I am much less interested in sex now
    3 I have lost interest in sex completely

The Beck Anxiety Inventory (Beck et al., 1988)

DATE:_____

Below is a list of common symptoms of anxiety. Please read each item in this list carefully. Please mark the appropriate space in the column next to each symptom to indicate the extent to which you have been bothered by the symptom during the PAST WEEK, INCLUDING TODAY.

	NOT AT ALL	MILDLY It didn't bother me much	MODERATELY It was very unpleasant but I could stand it	SEVERE I could barely stand it
1. Tingling or numbness				
2. Feeling hot				
3. Wobbly legs				
4. Unable to relax				
5. Fear of the worst happening				
6. Dizzy or light-headed				
7. Heart racing or thumping				
8. Unsteady				
9. Terrified				
10. Nervous				
11. Choking feelings				
12. Trembling hands				
13. Shaky				
14. Fear of losing control				
15. Trouble breathing				
16. Fear of dying				
17. Scared				
18. Indigestion or discomfort in abdomen				
19. Faint				
20. Flushed face				
21. Sweating (not because of heat)				

The Four Systems Anxiety Questionnaire (Koksal and Powers, 1991)

This questionnaire contains sixty (60) items concerning difficulties that most people experience from time to time. Read each item carefully.
IF YOU HAVE experienced any of the thoughts, feelings, physical symptoms or behaviours in the manner indicated by any of the items then put a tick (✓) into the space under column the column headed YES
IF YOU HAVE NOT, put a tick (✓) in the space under the column headed NO

Please make sure that none of the items are omitted.

There are no right or wrong answers. Do not spend too much time over any question, we are interested in your first reaction, not a deeply considered response.

Thank you for your participation.

	YES	NO
1. I blush easily		
2. I often feel so helpless, and desperate that life becomes a source of suffering for me		
3. Poor sleep is one of my biggest problems		
4. I often avoid talking to people in a train or bus		
5. I tend to avoid going out		
6. I often have a headache		
7. I often experience the feeling of embarrassment		
8. A jittery feeling has become part of my life		
9. I often have dizzy attacks		
10. I sometimes cannot think of anything except for my worries		
11. I seldom experience chest pains		
12. I seldom feel on edge		
13. I cannot concentrate on a task because of disruption by uncontrolled thoughts		
14. I rarely feel joyful		
15. I have persistent disturbing thoughts		
16. I definitely avoid going to any kind of place again,where I previously had a difficult time (for example a social gathering or a shop etc)		

	YES	NO
17. I sometimes think of myself as an inefficient person		
18. My feelings dominate my personality so much that I have no control over them		
19. I worry a lot when I think of possible disapproval from others		
20. I often experience the feeling of excitement		
21. I rarely try to steer clear of challenging jobs		
22. I rarely have disturbed sleep		
23. I sometimes feel upset		
24. My muscles are quite tense throughout the day		
25. When at home, I usually try not to stay alone at night		
26. I sometimes get easily tired even when I am not working hard		
27. I rarely worry about unimportant events		
28. I seldom laugh freely		
29. I usually worry that I will not be able to cope with difficulties in my life		
30. I tend to avoid talking to someone who is important such as my boss		
31. I rarely find myself lost in worrying		
32. Wherever I go, or whatever I do, I always have a feeling of discomfort		
33. I sometimes avoid participating in discussions even though I know the topic well		
34. My hands rarely shake		
35. I sometimes feel extremely self-conscious		
36. I am worried that others may misunderstand me		
37. I occasionally experience a tingling sensation around my body		
38. I rarely try to keep away from social gatherings		
39. I sometimes feel happy but it easily fades away		
40. Even if everything is going well, my mind is occupied by imaginary upsetting ideas		

	YES	NO
41. I seldom have palpitations		
42. I cannot think clearly about anything because disturbing thoughts keep occurring in my mind		
43. There seems to be a lump in my throat much of the time		
44. I cannot feel relaxed, even though I am not in a hurry		
45. I seldom avoid speaking at social occasions		
46. Even if it is necessary, I will sometimes avoid asking other people questions		
47. I very rarely imagine myself being unpopular with my friends		
48. I have diarrhoea once a month or more		
49. I often find myself thinking about embarrassing situations		
50. I usually feel quite insecure in my life		
51. I have a tight sensation in my neck		
52. I usually avoid getting involved in social activity		
53. My uneasy feelings can flare up at any moment		
54. I usually try to avoid walking in crowded streets		
55. I always feel irritable		
56. I hardly ever tell jokes		
57. I am concerned about how others view me		
58. I sometimes have stomach problems		
59. Half my thoughts are related to some kinds of worries		
60. I try to avoid standing up to other people even if they have taken advantage of me		

THANK YOU VERY MUCH FOR YOUR PARTICIPATION

The Anxiety Sensitivity Index (Taylor et al., 1992)

DATE:_____

Please rate the extent to which you agree with each item by selecting one of the points below.

0 = very little
1 = slightly
2 = moderately
3 = quite a lot
4 = very much

1.	It is important to me not to appear nervous.	0 1 2 3 4
2.	When I cannot keep my mind on a task, I worry that I might be going crazy.	0 1 2 3 4
3.	It scares me when I feel "shaky" (trembling).	0 1 2 3 4
4.	It scares me when I feel faint.	0 1 2 3 4
5.	It is important to stay in control of my emotions.	0 1 2 3 4
6.	It scares me when my heart beats rapidly.	0 1 2 3 4
7.	It embarrasses me when my stomach growls.	0 1 2 3 4
8.	It scares me when I am nauseous.	0 1 2 3 4
9.	When I notice that my heart is beating rapidly, I worry that I might have a heart attack.	0 1 2 3 4
10.	It scares me when I am short of breath.	0 1 2 3 4
11.	When my stomach is upset, I worry that I might be seriously ill.	0 1 2 3 4
12.	It scares me when I am unable to keep my mind on a task.	0 1 2 3 4
13.	Other people notice when I feel shaky.	0 1 2 3 4
14.	Unusual body sensations scare me.	0 1 2 3 4
16.	It scares me when I am nervous.	0 1 2 3 4

THANK YOU VERY MUCH!!

Religious Beliefs Questionnaire (based on Joughlin et al., 1992)

Do you have a religion? Yes / No. If yes, what is it?

Does (did) your mother have a religion Yes / No. If yes what is (was) it?

Does (did) your father have a religion Yes / No. If yes what is (was) it?

Please place a mark anywhere along the line below to indicate the extent to which the statement is true for you.

Example: I am religious

Not at all ——X—— Very

1. How important to you are your religious beliefs

Not at all ——————— Very

2. How do you feel your problem with obessions/compulsions has affected your religious belief?

Weakened it ——————— strengthened it

3. Do you feel that your religion offers you a clear set of moral guidelines?

Not at all ——————— Very much so

4. Has your obsessive-compulsive problem conflicted with the moral guidelines and code of conduct of your religion?

Not at all ——————— Very much so

5. How strong were your religious beliefs as a child?

Not at all ——————— Very strong

6. How important to your father are (were) his religious beliefs?

Not at all ——————— Very

7. How important to your mother are (were) her religious beliefs?

Not at all ——————— Very

8. Do (did) your parents' religious beliefs provide a clear set of moral guidelines for your family?

Not at all ——————— Very much so

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE

The Guilt Inventory (Kugler and Jones, 1992).

The Guilt Inventory: For this section of the questionnaire please answer the questions using the response format presented below:

5 = Very true of me or strongly agree
4 = True of me or agree
3 = Sometimes true sometimes not or undecided
2 = Not true of me or disagree
1 = Very untrue of me or strongly disagree

___ 1. I believe in a strict interpretation of right and wrong.

___ 2. I have made a lot of mistakes in my life.

___ 3. I have always believed strongly in a firm set of moral-ethical principles.

___ 4. Lately, I have felt good about myself and what I have done.

___ 5. If I could do certain things over again a great burden would be lifted form my shoulders.

___ 6. I have never felt great remorse or guilt.

___ 7. My goal in life is to enjoy it rather than to live up to some abstract set of moral principles.

___ 8. There is something in my past that I deeply regret.

___ 9. Frequently, I just hate myself for something I have done.

___ 10. My parents were very strict with me.

___ 11. There are only a few things I would never do.

___ 12. I often feel "not right" with myself because of something I have done.

___ 13. My ideas of right and wrong are quite flexible.

___ 14. If I could live my life over again there are a lot of things I would do differently.

___ 15. There are many things I would just never do because I believe they are wrong.

___ 16. I have recently done something that I deeply regret.

___ 17. Lately, it hasn't been easy being me.

___ 18. Morality is not as "black and white" as many people would suggest.

___ 19. Lately, I have been calm and worry-free.

___ 20. Guilt and remorse have been a part of my life for as long as I can recall.

_____21. Sometimes, when I think about certain things I have done I almost get sick.

_____22. In certain circumstances, there is almost nothing I wouldn't do.

_____23. I do not believe that I have made a lot of mistakes in my life.

_____24. I would rather die than commit a serious act of wrongdoing.

_____25. I feel a strong need to live up to my moral values.

_____26. I often have a strong sense of regret.

_____27. I worry a lot about things I have done in the past.

_____28. I believe that you can't judge whether something is right or wrong without knowing the motives of the people involved and the situation in which they are acting.

_____29. There are few things in my life that I regret having done.

_____30. If I could relive the last few weeks or months, there is absolutely nothing I have done that I would change.

_____31. I sometimes have trouble eating because of things I have done in the past.

_____32. I never worry about what I do; I believe life will take care of itself.

_____33. At the moment, I don't feel particularly guilty about anything I have done.

_____34. Sometimes I can't stop myself from thinking about things I have done which I consider to be wrong.

_____35. I never have trouble sleeping.

_____36. I would give anything if, somehow, I could go back and rectify some things I have recently done wrong.

_____37. There is at least one thing in my recent past that I would like to change.

_____38. I am immediately aware of it when I have done something morally wrong.

_____39. What is right or wrong depends on the situation.

_____40. Guilt is not a particular problem for me.

_____41. There is nothing in my past that I deeply regret.

_____42. I believe that moral values are absolute.

_____43. Recently, my life would have been much better if only I hadn't done what I did.

_____44. If I had my life to begin over again, I would change very little, if anything.

_____45. I have been worried and distressed lately.

The R-Scale (Salkvoskis, Gledhill and Reynolds, 1995)

This questionnaire lists different attitudes or beliefs which people sometimes hold. Read each statement carefully and decide how much you agree or disagree with it.

For each of the attitudes, show your answer by putting a circle round the words which BEST DESCRIBE HOW YOU THINK. Be sure to choose only one answer for each attitude. Because people are different, there is no right answer or wrong answer to these statements.

To decide whether a given attitude is typical of your way of looking at things, simply keep in mind what you are like MOST OF THE TIME.

I often feel responsible for things which go wrong.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

If I can have any influence on things going wrong, then I must act to prevent it.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

If I don't act when I can foresee danger, then I am to blame for any consequences if it happens.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

I am too sensitive to feeling responsible for things going wrong.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

My sins will find me out.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

If I Think bad things, this is as bad as <u>doing</u> bad things.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

I often cause harm.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

I worry a great deal about the effects of things which I do or don't do.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

To me, not acting to prevent disaster is as bad as making disaster happen.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

For me, carelessness is inexcusable when it might affect other people.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

Inactivity can cause as much harm as deliberate bad intentions.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

If I know that harm is possible, I should always try to prevent it, however unlikely it seems.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

Once I have caused harm, I can't forgive myself.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

I must always think through the consequences of even the smallest actions.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

I have done many things which might have harmed others.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

Other people are generally too careless.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

I often take responsibility for things which other people don't think are my fault.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

Everything I do can cause serious problems.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

It's no good me trying to put things right once they have gone wrong.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

I have to make sure other people are protected from things I do.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

I am often close to causing harm.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

I must protect others from harm.

TOTALLY AGREE | AGREE VERY MUCH | AGREE SLIGHTLY | NEUTRAL | DISAGREE SLIGHTLY | DISAGREE VERY MUCH | TOTALLY DISAGREE

I should never cause even the slightest harm to others.

TOTALLY AGREE	AGREE VERY MUCH	AGREE SLIGHTLY	NEUTRAL	DISAGREE SLIGHTLY	DISAGREE VERY MUCH	TOTALLY DISAGREE

Other people should not trust me in case I fail them.

TOTALLY AGREE	AGREE VERY MUCH	AGREE SLIGHTLY	NEUTRAL	DISAGREE SLIGHTLY	DISAGREE VERY MUCH	TOTALLY DISAGREE

I will be condemned for my actions.

TOTALLY AGREE	AGREE VERY MUCH	AGREE SLIGHTLY	NEUTRAL	DISAGREE SLIGHTLY	DISAGREE VERY MUCH	TOTALLY DISAGREE

Accidents are always preventable if I take sufficient care.

TOTALLY AGREE	AGREE VERY MUCH	AGREE SLIGHTLY	NEUTRAL	DISAGREE SLIGHTLY	DISAGREE VERY MUCH	TOTALLY DISAGREE

Bad things can easily happen as a result of my carelessness.

TOTALLY AGREE	AGREE VERY MUCH	AGREE SLIGHTLY	NEUTRAL	DISAGREE SLIGHTLY	DISAGREE VERY MUCH	TOTALLY DISAGREE

If I can have even a slight influence on things going wrong, then I must act to prevent it.

TOTALLY AGREE	AGREE VERY MUCH	AGREE SLIGHTLY	NEUTRAL	DISAGREE SLIGHTLY	DISAGREE VERY MUCH	TOTALLY DISAGREE

I need to be careful because I may often be close to causing harm.

TOTALLY AGREE	AGREE VERY MUCH	AGREE SLIGHTLY	NEUTRAL	DISAGREE SLIGHTLY	DISAGREE VERY MUCH	TOTALLY DISAGREE

I worry a great deal about the bad effects of things which I do or don't do.

TOTALLY AGREE	AGREE VERY MUCH	AGREE SLIGHTLY	NEUTRAL	DISAGREE SLIGHTLY	DISAGREE VERY MUCH	TOTALLY DISAGREE

To me, not acting where disaster is a slight possibility is as bad as making that disaster happen.

TOTALLY AGREE	AGREE VERY MUCH	AGREE SLIGHTLY	NEUTRAL	DISAGREE SLIGHTLY	DISAGREE VERY MUCH	TOTALLY DISAGREE

For me, even slight carelessness is inexcusable when it might affect other people.

TOTALLY AGREE	AGREE VERY MUCH	AGREE SLIGHTLY	NEUTRAL	DISAGREE SLIGHTLY	DISAGREE VERY MUCH	TOTALLY DISAGREE

In all kinds of daily situations, my inactivity can cause as much harm as deliberate bad intentions.

TOTALLY AGREE	AGREE VERY MUCH	AGREE SLIGHTLY	NEUTRAL	DISAGREE SLIGHTLY	DISAGREE VERY MUCH	TOTALLY DISAGREE

Even if harm is a very unlikely possibility, I should always try to prevent it at any cost.

TOTALLY AGREE	AGREE VERY MUCH	AGREE SLIGHTLY	NEUTRAL	DISAGREE SLIGHTLY	DISAGREE VERY MUCH	TOTALLY DISAGREE

Once I think it is possible that I have caused harm, I can't forgive myself.

TOTALLY AGREE	AGREE VERY MUCH	AGREE SLIGHTLY	NEUTRAL	DISAGREE SLIGHTLY	DISAGREE VERY MUCH	TOTALLY DISAGREE

Many of my past actions have been intended to prevent harm to others.

TOTALLY AGREE	AGREE VERY MUCH	AGREE SLIGHTLY	NEUTRAL	DISAGREE SLIGHTLY	DISAGREE VERY MUCH	TOTALLY DISAGREE

It's no good me trying to put things right once they have gone wrong.

TOTALLY AGREE	AGREE VERY MUCH	AGREE SLIGHTLY	NEUTRAL	DISAGREE SLIGHTLY	DISAGREE VERY MUCH	TOTALLY DISAGREE

I have to make sure other people are protected from all of the consequences of things I do.

TOTALLY AGREE	AGREE VERY MUCH	AGREE SLIGHTLY	NEUTRAL	DISAGREE SLIGHTLY	DISAGREE VERY MUCH	TOTALLY DISAGREE

I must constantly be aware of the need to protect others from any possibility of harm.

TOTALLY AGREE	AGREE VERY MUCH	AGREE SLIGHTLY	NEUTRAL	DISAGREE SLIGHTLY	DISAGREE VERY MUCH	TOTALLY DISAGREE

Other people should not rely on my judgement.

TOTALLY AGREE	AGREE VERY MUCH	AGREE SLIGHTLY	NEUTRAL	DISAGREE SLIGHTLY	DISAGREE VERY MUCH	TOTALLY DISAGREE

If I cannot be <u>certain</u> I am blameless, I feel that I am to blame.

TOTALLY AGREE	AGREE VERY MUCH	AGREE SLIGHTLY	NEUTRAL	DISAGREE SLIGHTLY	DISAGREE VERY MUCH	TOTALLY DISAGREE

If I take sufficient care then I can prevent any harmful accidents.

TOTALLY AGREE	AGREE VERY MUCH	AGREE SLIGHTLY	NEUTRAL	DISAGREE SLIGHTLY	DISAGREE VERY MUCH	TOTALLY DISAGREE

I often think that bad things will happen if I am not careful enough.

TOTALLY AGREE	AGREE VERY MUCH	AGREE SLIGHTLY	NEUTRAL	DISAGREE SLIGHTLY	DISAGREE VERY MUCH	TOTALLY DISAGREE

The Responsibility Appraisal Questionnaire (18 items - questions 1, 3-19)
(Rachman et al., 1995)

Please place a number from 1 to 6 in the space beside each question to indicate how much you agree or disagree with each statement about yourself. Please answer all the questions using the scale below:-

6 = Absolutely agree
5 = Mostly agree
4 = Somewhat agree
3 = Somewhat disagree
2 = Mostly disagree
1 = Absolutely disagree

1. _____ When I am in a restaurant with friends, it is up to me to personally ensure that we have left a sufficiently large tip.

2. _____ It is up to me to protect other people from harm.

3. _____ I would take special care when driving near a playground.

4. _____ It is important to me to fulfil my social obligations.

5. _____ I would inform the manager if I smelled smoke in a store.

6. _____ I would welcome the opportunity to take on new responsibilities.

7. _____ My mean thoughts wishing a person harm can increase the chance that something harmful will happen to him/her.

8. _____ I would carry passengers in the car when road conditions were dangerous.

9. _____ I would be obliged to lend a friend money if asked.

10. _____ If my car were making an unusual noise, I would continue to drive it.

11. _____ For me, having a mean thought is almost as bad as doing something mean.

12. _____ I would welcome the opportunity to take the lead in team projects/events.

13. _____ I would remember to send a card or call a friend on his/her birthday.

14. _____ If I have a thought about something horrible happening to an acquaintance, it may bring them bad luck.

15. _____ I would welcome the opportunity of being entrusted with other people's belongings.

16. _____ I would return a borrowed book which I had slightly torn without saying anything about the damage.

17. _____ I would be able to turn down an invitation from a friend.

18. _____ My mean thoughts can have the same consequences as my mean actions.

19. _____ I would welcome the opportunity to be put in charge of the safety of buildings.

Questions asked in the Responsibility Manipulation

Subject I.D. _____

THE THOUGHT IS

_____

_____

THE THREAT IS

_____

_____

THE BEHAVIOUR IS

_____

_____

Condition Order:

notes

_____

_____

SCALE 0 = NOT AT ALL 100 = EXTREMELY HIGH	Date Situation	Date Situation
Urge to perform behaviour_____		
Discomfort / anxiety _____		
Perceived responsibility for threat _____		
Perceived responsibility for thoughts _____		
Likelihood of threat ____		
Control over threat _____		

Table 2 **No._____**

Are you experiencing any of the following feelings. If so, how strong they?

0 = Not experience the feeling at all 100 = Very strong	Date: Situation	Date: Situation
Heart palpitations		
Pressure in chest		
Numbness in arms or legs		
Numbness in another part of body		
feeling short of breath		
dizziness		
blurred or distorted vision		
nausea		
Butterflies in stomach		
Knot in stomach		
Lump in throat		
Wobbly or rubber legs		
Sweating		
Dry throat		
feeling disoriented and confused		
feeling disconnected from your body, only partly present		
Others (details)		

Table 3 No.____

Are you experiencing any of the following thoughts? If so, how strong are they?

0 = Not experiencing the thought 100 = experiencing the thought very strongly	Date Situation	Date Situation
I am going to throw up		
I am going to pass out		
I must have a brain tumour		
I will have a heart attack		
I will choke to death		
I am going to act foolish		
I am going blind		
I will not be able to control myself		
I will hurt someone		
I am going to have a stroke		
I am going to go crazy		
I am going to scream		
I am going to babble or talk funny		
I will be paralysed by fear.		
Other (give details) _____ _____		

Thought-Action Fusion Scale (Rachman et al., 1995)

		Disagree Strongly	Disagree	Neutral	Agree	Agree Strongly
1.	If I think of a friend failing a test, this increases the risk that he/she will fail a test	0	1	2	3	4
2.	Thinking about hitting someone is as unacceptable to me as actually doing it	0	1	2	3	4
3.	If I think of myself losing my job, this increases the risk that I will lose my job	0	1	2	3	4
4.	If I think of myself failing a test, this increases the risk that I will fail a test	0	1	2	3	4
5.	If I think of a friend passing a test, this increases the chance that he/she will pass the test	0	1	2	3	4
6.	If I think of a relative/friend losing her job, this increases the risk that he/she will lose her job	0	1	2	3	4
7.	If I think of a relative/friend being in a car accident, this increases the risk that he/she will have a car accident	0	1	2	3	4
8.	If I think of harm coming to myself, this increases the risk that I will come to harm	0	1	2	3	4
9.	Thinking about making an obscene gesture to someone else is almost as bad as doing it	0	1	2	3	4
10.	If I think of harm coming to a close relative/friend, this increases the risk that he/she will come to harm	0	1	2	3	4
11.	Having a jealous thought is almost the same as making a jealous remark	0	1	2	3	4
12.	Thinking of cheating in a personal relationship is almost as unacceptable to me as actually cheating	0	1	2	3	4
13.	If I think of myself obtaining a desirable job, this increases the chance that I will obtain a desirable job	0	1	2	3	4
14.	If I think of myself winning the lottery, this increases the chance that I will win	0	1	2	3	4
15.	If I think of a relative/friend winning the lottery, this increases the chance that he will win	0	1	2	3	4
16.	If I think of myself inheriting a lot of money, this increases the chance that I will inherit a lot of money	0	1	2	3	4
17.	Wishing harm on someone else is almost as bad as doing harm	0	1	2	3	4
18.	If I think of myself falling ill, this increases the risk that I will fall ill	0	1	2	3	4
19.	If I think of a relative/friend falling ill this increases the risk that he/she will fall ill	0	1	2	3	4

		Disagree Strongly	Disagree	Neutral	Agree	Agree Strongly
20.	If I think of a friend's relationship ending, this increases the risk that his/her relationship will end.	0	1	2	3	4
21.	Having violent thoughts is almost as unacceptable to me as violent acts.	0	1	2	3	4
22.	If I think of a friend/relative obtaining a desirable job, this increases the chance that he/she will obtain a desirable job	0	1	2	3	4
23.	Thinking unkindly about a friend is almost as disloyal as doing an unkind act	0	1	2	3	4
24.	If I think of a friend/relative inheriting a lot of money, this increases the chance that he/she will inherit a lot of money	0	1	2	3	4
25.	Having a nasty thought about someone else is almost as bad as carrying out a nasty action	0	1	2	3	4
26.	Thinking of making an extremely critical remark to a friend is almost as unacceptable as actually saying it	0	1	2	3	4
27.	Thinking about making an obscene remark or gesture in church is almost as sinful as actually doing it	0	1	2	3	4
28.	Having obscene thoughts in a church is unacceptable to me	0	1	2	3	4
29.	Thinking about swearing at someone else is almost as unacceptable to me as actually swearing	0	1	2	3	4
30.	If I think of myself passing a test, this increases the chance that I will pass a test	0	1	2	3	4
31.	If I think of myself being in a car accident, this increases the risk that I will have a car accident..	0	1	2	3	4
32.	If I think of a friend/relative being injured in a fall, this increases the risk that he/she will have a fall and be injured	0	1	2	3	4
33.	Having a blasphemous thought is almost as sinful as a blasphemous action	0	1	2	3	4
34.	If I think of myself being injured in a fall, this increases the risk that I will have a fall and be injured	0	1	2	3	4

PAGE
MISSING
IN
ORIGINAL

Impulses-Behaviour Scale

		Not At All	A Little	Some	Much	Ver Muc
1.	I try to avoid walking close to busy roads	0	1	2	3	4
2.	I try to avoid driving when alone	0	1	2	3	4
3.	If I have an unwanted urge, I try to counter it by a thought or action	0	1	2	3	4
4.	I try to avoid being alone with young children	0	1	2	3	4
5.	I try to avoid driving on freeways	0	1	2	3	4
6.	If I have an unwanted urge, I try to leave the situation somehow	0	1	2	3	4
7.	I have to check things over and over.	0	1	2	3	4
8.	If I have an unwanted urge, I try to neutralize it	0	1	2	3	4
9.	I try to avoid school playgrounds	0	1	2	3	4
10.	I try to avoid public parks	0	1	2	3	4
11.	I try to avoid walking over bridges	0	1	2	3	4
12.	If I have an unwanted urge, I feel that I should correct it some way or other	0	1	2	3	4
13.	I try to avoid driving over bridges	0	1	2	3	4
14.	If I have an unwanted urge, I feel that I must cancel it out somehow.	0	1	2	3	4
15.	I repeatedly seek reassurance from others	0	1	2	3	4
16.	I try to avoid driving through tunnels.	0	1	2	3	4
17.	If I have an unwanted urge, I try somehow to put matters right	0	1	2	3	4
18.	I try to avoid seeing or using sharp instruments	0	1	2	3	4
19.	I try to avoid having medicine lying around my house	0	1	2	3	4
20.	I try to avoid high places	0	1	2	3	4
21.	If I have an unwanted urge, I try to balance it with a desired thought or action	0	1	2	3	4
22.	I try to avoid being alone with elderly people	0	1	2	3	4

Images and Images Behaviour Scale

DO YOU FIND THAT CERTAIN UNWANTED IMAGES, "PICTURES IN THE MIND," KEEP COMING INTO YOUR HEAD AGAINST YOUR WILL?

		Never	Infreq-uently	Some-times	Often	Very Often
1.	I experience the same unwanted image about being trapped	0	1	2	3	4
2.	I experience the same unwanted image about illness	0	1	2	3	4
3.	I experience the same unwanted image about being chased	0	1	2	3	4
4.	I experience the same unwanted image about losing control	0	1	2	3	4
5.	I experience the same unwanted image about suffocating	0	1	2	3	4
6.	I experience the same unwanted image about an accident	0	1	2	3	4
7.	I experience the same unwanted image about falling	0	1	2	3	4
8.	I experience the same unwanted image about being abandoned	0	1	2	3	4
9.	I experience the same unwanted image about a natural disaster	0	1	2	3	4
10.	I experience the same unwanted image about blood	0	1	2	3	4
11.	I experience the same unwanted image about being physically restricted	0	1	2	3	4
12.	I experience the same unwanted image about a fire	0	1	2	3	4
13.	I experience the same unwanted image about death	0	1	2	3	4
14.	I experience the same unwanted image about being injured	0	1	2	3	4
15.	If I have an unwanted image, I feel that I should balance it with a pleasant image	0	1	2	3	4
16.	If I have an unwanted image, I feel that I should try to correct it in some way or other	0	1	2	3	4
17.	If I have an unwanted image, I try to neutralize it.	0	1	2	3	4
18.	If I have an unwanted image, I try somehow to put matters right.	0	1	2	3	4

Do you have any other sorts of unwanted images?
If so, please describe below:-

Response to Thoughts scale

HAVING A NASTY THOUGHT ABOUT SOMEONE ELSE MAKES ME . . .

	Not at All	A Little	Some	Much	Very Much
1.....feel that I must keep it secret	0	1	2	3	4
2.....feel that I should balance it with a pleasant thought	0	1	2	3	4
3.....feel that I have a very mean streak in me	0	1	2	3	4
4.....feel ashamed	0	1	2	3	4
5.....feel that I should try to correct it in some way or other	0	1	2	3	4
6.....feel that I am a dangerous person	0	1	2	3	4
7.....feel that I am losing control	0	1	2	3	4
8.....feel that deep down I really wish to be mean	0	1	2	3	4
9.....feel that I cannot trust myself	0	1	2	3	4
10.....feel sad	0	1	2	3	4
11.....feel that I lack self-control	0	1	2	3	4
12.....feel that I am a bad person	0	1	2	3	4
13.....feel embarrassed	0	1	2	3	4
14.....feel that I should be punished	0	1	2	3	4
15.....feel guilty	0	1	2	3	4
16.....feel that I am a freak	0	1	2	3	4
17.....feel that I must somehow cancel out the thought	0	1	2	3	4
18.....feel that I am a dishonest person	0	1	2	3	4
19.....feel that I am unlike other people	0	1	2	3	4
20.....feel angry	0	1	2	3	4
21.....feel that I am to blame	0	1	2	3	4

Neurological Soft Signs Score Sheet (Chen et al., 1995)

NEUROLOGICAL SOFT SIGNS ASSESSMENT SCORES
PATIENT:

PART 1

ARTIC	[	]	[	]
APROS	[	]	[	]
UNINT	[	]	[	]
EXT SPM	[	]	[	]
SMO SPM	[	]	[	]
IPR GZ	[	]	[	]
SC SMO	[	]	[	]
SC BLK	[	]	[	]
SC HEAD	[	]	[	]
WINK	[	]	[	]
GLAB	[	]	[	]
RAP TN	[	]	[	]
IPR TN	[	]	[	]
PTR L	[	]	[	]
PTR R	[	]	[	]

	TONE	STRENGTH	REFLEX
UPPER LIMB INCREASED			
UPPER LIMB DECREASED			
LOWER LIMB INCREASED			
LOWER LIMB DECREASED			

PART 2

SNOUT	[	]	[	]
GRA	[	]	[	]
P-M	[	]	[	]
FG-NOS L	[	]	[	]
FG-NOS R	[	]	[	]
FGTHTAP L	[	]	[	]
FGTHTAP R	[	]	[	]
FG TH L	[	]	[	]
FG TH R	[	]	[	]
MIRROR 1 L	[	]	[	]
MIRROR 1 R	[	]	[	]
DIADOCK L	[	]	[	]
DIADOCK R	[	]	[	]
MIRROR 2 L	[	]	[	]
MIRROR 2 R	[	]	[	]
FEP L	[	]	[	]
FEP R	[	]	[	]
OZE L	[	]	[	]
OZE R	[	]	[	]

RHY TAP [ ] [ ]

	STIMULUS SEQUENCE	RESPONSE
1	* * * * *	
2	. * . * .	
3	* . . * . . * . .	
4	* . . . * *	
5	. . * . .	

GO NOGO [ ] [ ]

STIMULUS	* *	*	*	*		
RESPONSE						

EXTINCT [ ] [ ]

STIMULU	*RIGHT CHEEK*	*LEFT CHEEK*	*RIGHT CHEEK*	*LEFT CHEEK*	*RIGHT HAND*	*RIGHT CHEEK*
STIMULU	*LEFT HAND*	*RIGHT HAND*	*RIGHT HAND*	*LEFT HAND*	*LEFT HAND*	*LEFT CHEEK*
RESPONS						

FG AGN L [ ] [ ]
FG AGN R [ ] [ ]

LEFT HAND	2 - 4	1 - 3	3.-.4	2.-.5	1.-.5
RESPONSE					
RIGHT HAND	1.-.3	2.-.4	1.-.4	2.-.3	1.-.5
RESPONSE					

STEREO L [ ] [ ]
STEREO R [ ] [ ]

GRAPH L [ ] [ ]
GRAPH R [ ] [ ]

LEFT HAND	3	7	8	5	9
RESPONSE					
RIGHT HAND	2	4	0	3	6
RESPONSE					

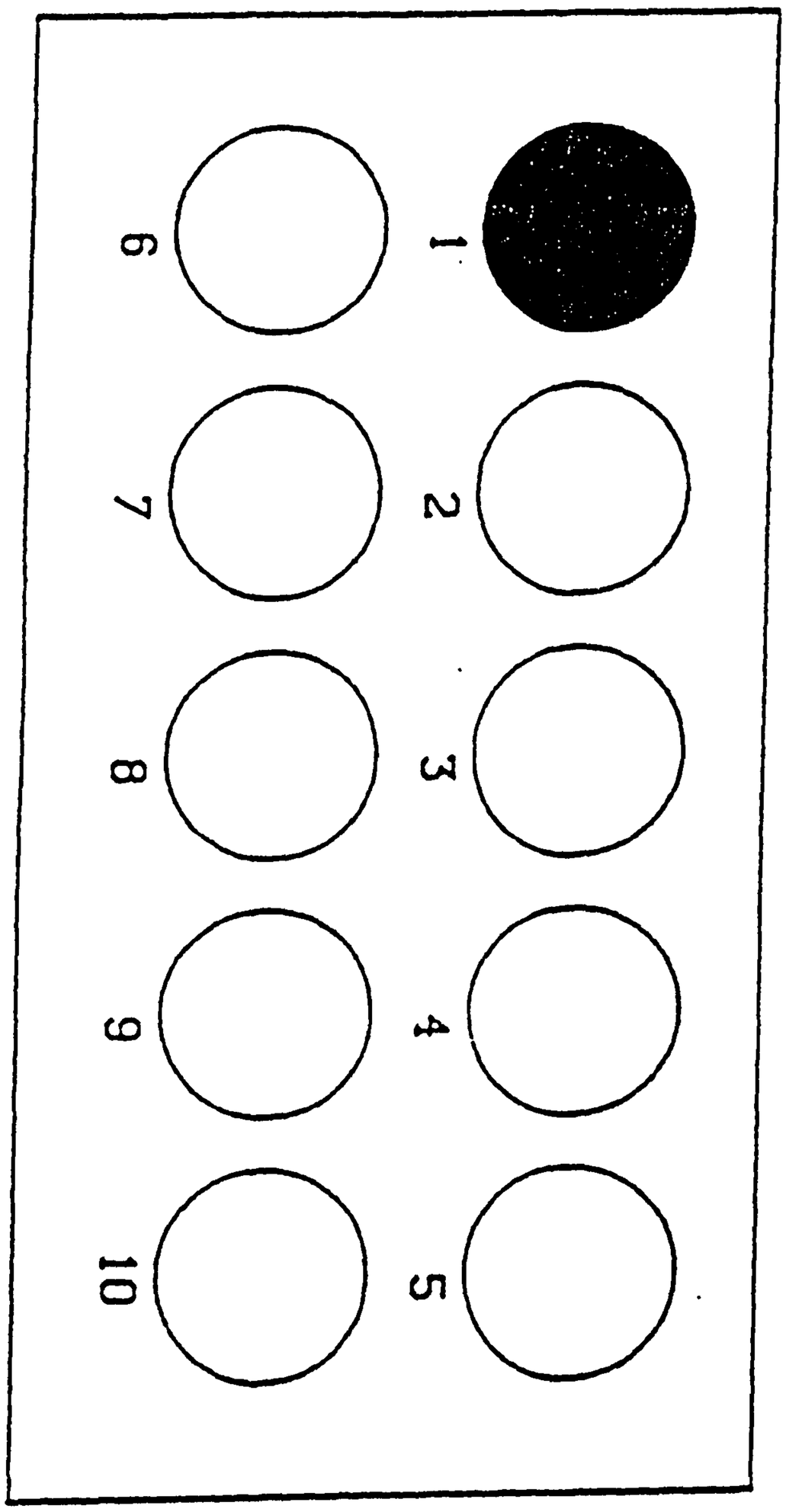
LR ORN [ ] [ ]

POINT TO	YOUR RIGHT FOOT	YOUR LEFT HAND	YOUR LEFT SHOULDE	YOUR RIGHT EAR	MY LEFT KNEE	MY RIGHT ELBOW	MY LEFT HAND	MY RIGHT HAND
WITH			YOUR RIGHT HAND	YOUR LEFT HAND			YOUR RIGHT HAND	YOUR LEFT HAND

PART 3

GAIT IN [ ] [ ]
GAIT DE [ ] [ ]
GAIT SL [ ] [ ]
GAIT MN [ ] [ ]
FACE DYS [ ] [ ]
FACE SUS [ ] [ ]
FACE CX [ ] [ ]
GEGENH [ ] [ ]
MITG [ ] [ ]
SP POSTR [ ] [ ]
CX POSTR [ ] [ ]
IM POSTR [ ] [ ]
TK LB DYS [ ] [ ]
TK LB SUS [ ] [ ]
TK LB CX [ ] [ ]
~~STAND~~ [ ] [ ]
PRO [ ] [ ]
ARM [ ] [ ]
TREMOR [ ] [ ]
ROMBERG [ ] [ ]
BALANCE L [ ] [ ]
~~BALANCE R~~ [ ] [ ]
WALK [ ] [ ]
STOP [ ] [ ]
TURN [ ] [ ]
TANDEM [ ] [ ]
ABRUPT SM [ ] [ ]
SLOW SM [ ] [ ]
EXAGG SM [ ] [ ]
ITER SM [ ] [ ]
OTHER SM [ ] [ ]
MUTISM [ ] [ ]
NECKRIG [ ] [ ]
OVERACT [ ] [ ]
UNDERACT [ ] [ ]
AUTO OBE [ ] [ ]
NONCOMPL [ ] [ ]
AB BEH [ ] [ ]
ECHO [ ] [ ]
PERSERV [ ] [ ]

Sample of the Brixton (Burgess and Shallice, 1994a)



The Hayling (Burgess and Shallice, 1994b)

ame: _____
ate: _____
ge: _____

traightforward Completion:

amples: a) The wealthy child attended a private _____
b) The crime rate has gone up this _____

	Time
He posted the letter without a	
In the first space enter your	
The old house will be torn	
Its hard to admit when one is	
Her job was easy most of the	
When you go to bed, turn off the	
The game was stopped when it started to	
He scraped the cold food from his	
The dispute was settled by a third	
Three people were killed in a major motorway	
The baby cried and upset her	
George could not believe that his son had stolen a	
He crept into the room without a	
Billy hit his sister on the	
Too many men are out of	

malous Completion:

mples: a) London is a very busy _____
b) Her new shoes were the wrong _____

The captain wanted to stay with the sinking	
They went as far as they	
Most cats see very well at	
Jean was glad the affair was	
The whole town came to hear the mayor	
Most sharks attack very close to	
None of the books made any	
The douch was put in the hot	
He called the husband at his	
All the guests had a very good	
He bought them in the sweet	
His leaving home amazed all his	
At last the time for action had	
The dog chased our cat up the	
At night they often took a short	

l Time Section A: _____
l Time Section B: _____
Time: _____
: Score Section B: _____